TM 9-219

WAR DEPARTMENT TECHNICAL MANUAL

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BASIC AIRCRAFT MACHINE GUNS, CAL. .50, T36 AND T25E3(M3)

RESTRICTED. DISSEMINATION OF RESTRICTED MATTER. No person is entitled solely by virtue of his grade or position to knowledge or possession of classified matter. Such matter is entrusted only to those individuals whose official duties require such knowledge or possession. (See also paragraph 23b, AR 380–5, 15 March 1944.)

WAR DEPARTMENT • *5 APRIL 1945*

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WAR DEPARTMENT
Washington 25, D. C., 5 April 1945

TM 9-219, Basic Aircraft Machine Guns, Cal. .50, T36 and T25E3, is published for the information and guidance of all concerned.

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The Adjutant General.

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(Refer to FM 21-6 for explanation of distribution formula.)

CONTENTS

PART ONE — INTRODUCTION

		Paragraphs	Pages
SECTION	I. General	1–2	1
	II. Description and data	3–6	2–16
	III. Tools, parts, and accessories	7–8	17–21

PART TWO — OPERATING INSTRUCTIONS

SECTION	IV. General	9	22
	V. Service upon receipt of equipment	10–11	22–26
	VI. Controls	12–14	26–27
	VII. Operation under usual conditions	15–22	27–38
	VIII. Operation under unusual conditions	23–28	39–41
	IX. Demolition to prevent enemy use	29–30	41–42

PART THREE — MAINTENANCE INSTRUCTIONS

SECTION	X. General	31	43
	XI. Special organizational tools and equipment	32	43–49
	XII. Lubrication	33–34	50–51
	XIII. Preventive maintenance service	35–37	51–53
	XIV. Malfunctions and corrections	38–42	54–64
	XV. Back plate group (gun T36)	43–49	64–67
	XVI. Back plate group (gun T25E3)	50–56	67–71

CONTENTS – Contd.

		Paragraphs	Pages
SECTION	XVII. Bolt group (guns T36 and T25E3)	57– 65	71– 88
	XVIII. Oil buffer group (gun T36)	66– 73	88– 96
	XIX. Barrel buffer group (gun T25E3)	74– 80	96–101
	XX. Barrel and barrel extension group (guns T36 and T25E3)	81– 88	101–103
	XXI. Cover group (guns T36 and T25E3)	89– 95	104–110
	XXII. Receiver and barrel jacket group (guns T36 and T25E3)	96–101	110–116
	XXIII. Operating slide group (gun T36)	102–109	117–118
	XXIV. Retracting slide group (guns T36 and T25E3)	110–114	118–125
	PART FOUR — AUXILIARY EQUIPMENT		
SECTION	XXV. General	115	126
	XXVI. Ammunition	116–126	126–139
	APPENDIX		
SECTION	XXVII. Storage and shipment	127–129	140–145
	XXVIII. References	130–132	146–148
INDEX			147–151

RESTRICTED

PART ONE — INTRODUCTION

Section I

GENERAL

1. SCOPE.*

a. This Technical Manual is published for the information of the using arms and services.

b. In addition to a description of the Basic Aircraft Machine Gun, Cal. .50, T36 and Basic Aircraft Machine Gun, Cal. .50, T25E3, this manual contains technical information required for the identification, use, and care of the weapons, ammunition and accessory equipment.

c. In all cases where the nature of the repair, modification, or adjustment is beyond the scope or facilities of the unit, the responsible ordnance service should be informed so that trained personnel with suitable tools and equipment may be provided, or proper instructions issued.

2. RECORDS.

a. Field Report of Accidents. When an accident involving ammunition occurs during practice, the incident will be reported as prescribed in AR 750-10 by the ordnance officer under whose supervision the ammunition is maintained or issued. Where practicable, reports covering malfunctions of ammunition in combat will be made to the Chief of Ordnance, giving the type of malfunction, type of ammunition, the lot number of the complete rounds, and condition under which fired.

b. Unsatisfactory Report. Suggestions for improvement in manufacture, design, maintenance, safety, and efficiency of operation prompted by chronic failure or malfunction of the weapon, spare parts, or equipment should be reported on WD AAF Form No. 54, Unsatisfactory Report, with all pertinent information necessary to initiate corrective action. This form will also be used for reporting complaints on the application or effect of prescribed petroleum fuels, lubricants, and preserving materials, and, when so used, will contain identifying details on both the products and the associated equipment. The report should be forwarded to: Commanding General, Headquarters Air Technical Service Command, Wright Field, Dayton, Ohio, with carbon copy direct to the Office, Chief of Ordnance, Field Service, Maintenance Division. If WD AAF Form No. 54 is not available, one may be improvised by referring to sample in TM 37-250.

*To provide operating instructions with the materiel, this Technical Manual has been published in advance of complete technical review. Any errors or omissions will be corrected by changes or, if extensive, by an early revision.

BASIC AIRCRAFT MACHINE GUNS, CAL. .50, T36 AND T25E3

Section II

DESCRIPTION AND DATA

3. GENERAL.

a. The Basic Aircraft Machine Guns, Cal. .50, T36 and T25E3 (figs. 1 through 7) are basically the same in general appearance and functioning as the Basic Aircraft Browning Machine Gun, Cal. .50, M2. They are recoil-operated, belt-fed, air-cooled machine guns. A metallic link, disintegrating belt is used in all firing of the guns. By properly repositioning some of the component parts, both guns may be fed from either the right or left side.

4. IDENTIFICATION INFORMATION.

a. One serial number is required for records concerning these weapons. The serial number is located on the right side plate just below the feedway (fig. 7) and on the top plate (fig. 5).

5. DIFFERENCES IN MODELS.

a. The Basic Aircraft Machine Gun, Cal. .50, T36 differs from the Basic Aircraft Browning Machine Gun, Cal. .50, M2 in the following respects:

(1) A recoil booster (fig. 8) is substituted for the front barrel bearing.

(2) A new designed cover group (fig. 9) is substituted for the M2 cover group. The cover which differs slightly in shape from the M2 design, houses a new belt feed slide assembly, a longer belt feed pawl, and a more rigid belt feed lever.

(3) Two belt holding pawls nested together around a spacing sleeve and each operated by a separate spring replaces the single belt holding pawl and twin springs used on the Gun M2 (fig. 10). This feature is being incorporated into Guns M2 now in production.

(4) An accelerator stop and accelerator stop lock (fig. 11) replaces the sear stop assembly on the Gun M2. This feature will be built into the bolt, similar to that of the T25E3, in later production models.

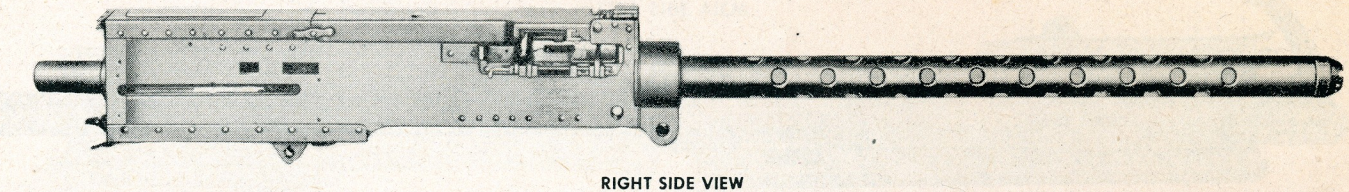
(5) The extractor assembly has a larger ejector pin.

(6) A short round stop (fig. 12) located on the under side of the cover clipped over the belt feed slide retainer has been added.

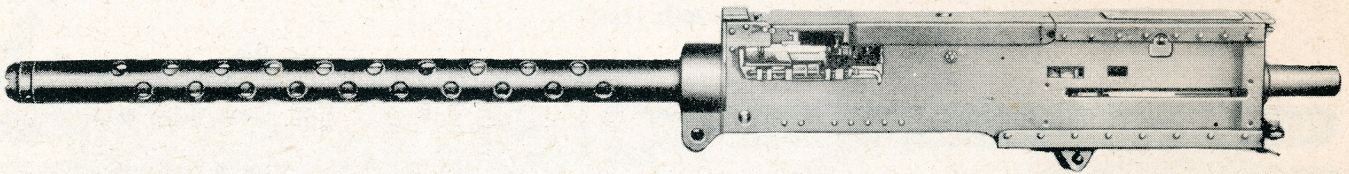
(7) The oil buffer group is the same as used in the Heavy Barrel Browning Machine Gun, Cal. .50, M2, (par. 66).

(8) A new barrel.

b. Basic Aircraft Machine Gun, Cal. .50, T25E3 differs from the Basic Aircraft Browning Machine Gun, Cal. .50, M2, as follows:



RIGHT SIDE VIEW



LEFT SIDE VIEW

RA PD 95349

Figure 1 — Basic Aircraft Machine Gun, Cal. .50, T36

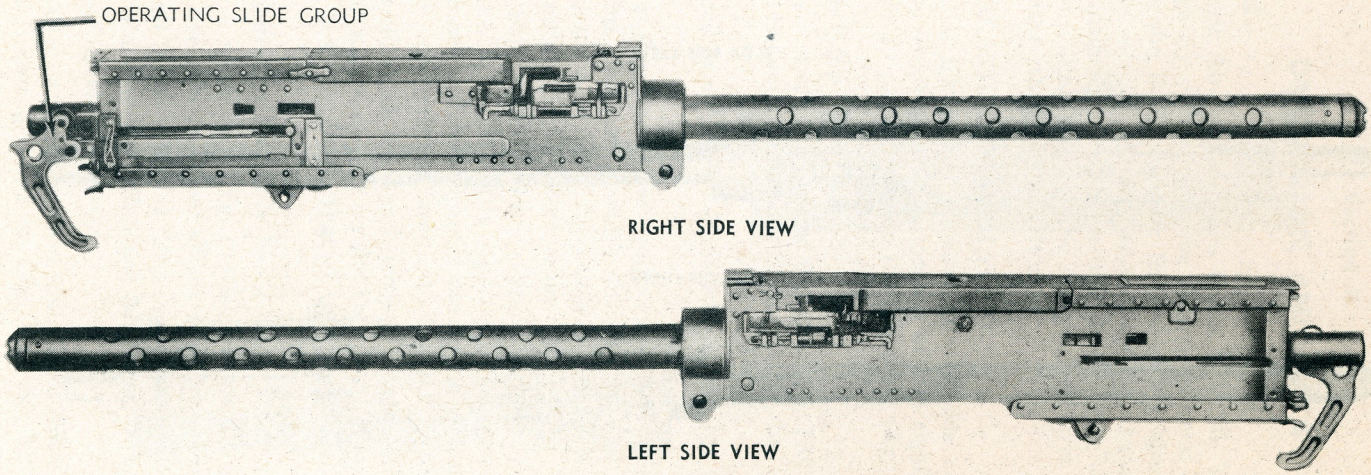


Figure 2 — Basic Aircraft Machine Gun, Cal. .50, T36 — With Operating Slide Group

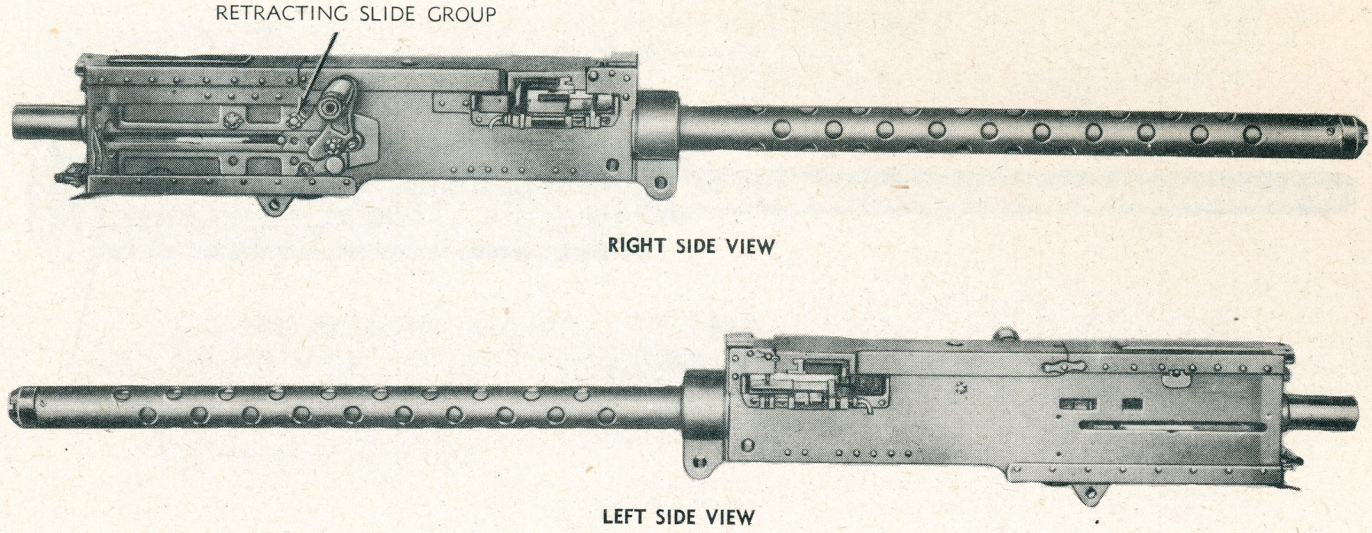


Figure 3 — Basic Aircraft Machine Gun, Cal. .50, T36 — With Retracting Slide Group

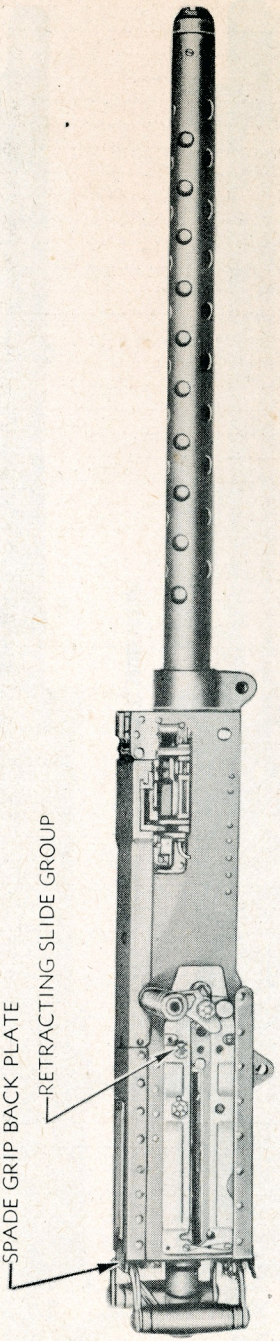


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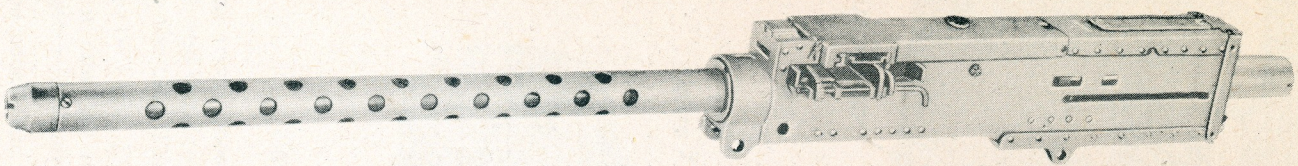
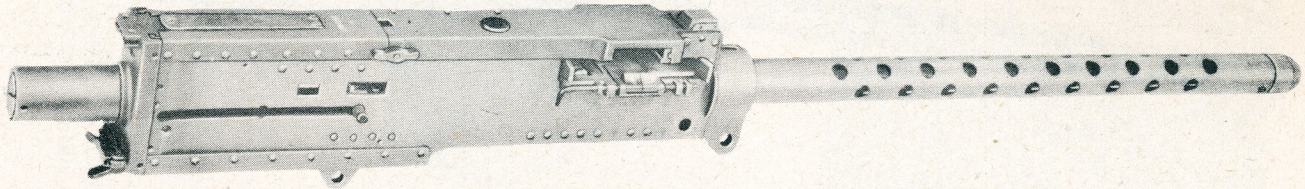
Figure 4 — Basic Aircraft Machine Gun, Cal. .50, T36 — With Retracting Slide Group and Spade Grip Back Plate



LEFT SIDE VIEW



RIGHT SIDE VIEW

RA PD 95324

Figure 5 — Basic Aircraft Machine Gun, Cal. .50, T25E3

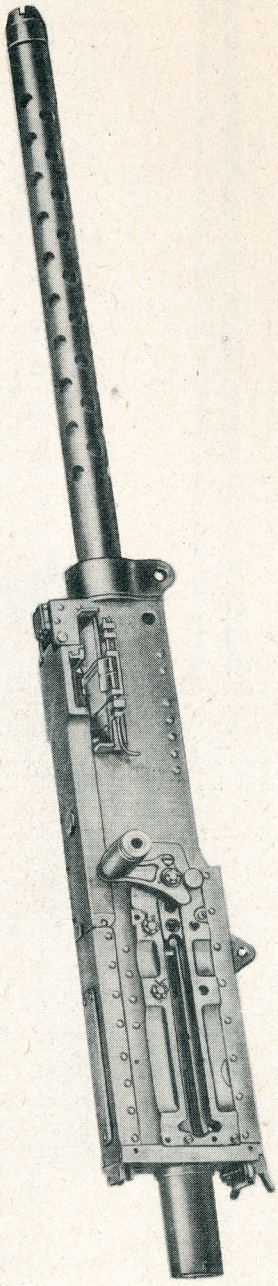


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Figure 6 — Basic Aircraft Machine Gun, Cal. .50, T25E3 — With Retracting Slide Group

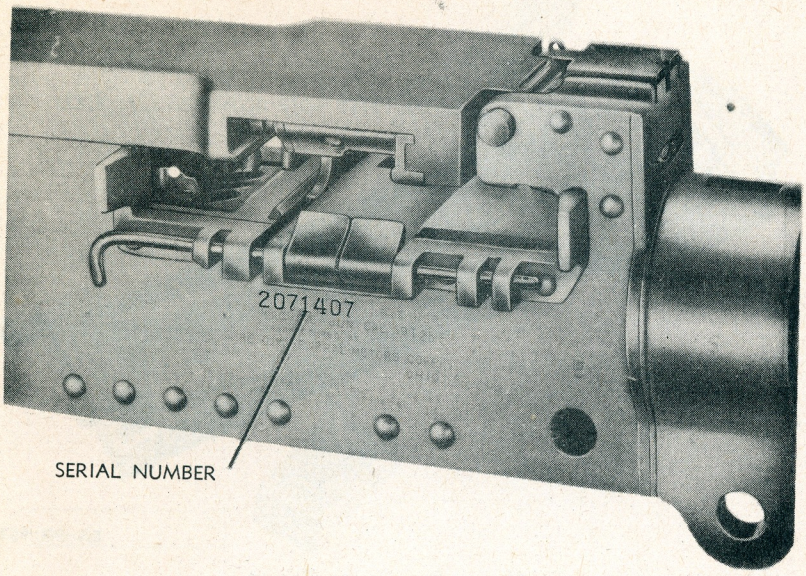

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Figure 7 — Location of Serial Number

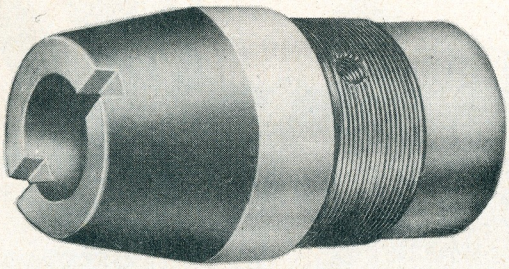

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Figure 8 — Recoil Booster

(1) The recoil booster, cover group, belt holding pawls, breech lock, barrel, and short round stop described in subparagraph **a**, above, are used in the Gun T25E3 also.

(2) The bolt (fig. 13) has been redesigned. In order to decrease its weight, it now has several holes drilled completely through the sides, and other lightening cuts.

(3) The accelerator (fig. 14) has been redesigned by changing the curvature of the claw end.

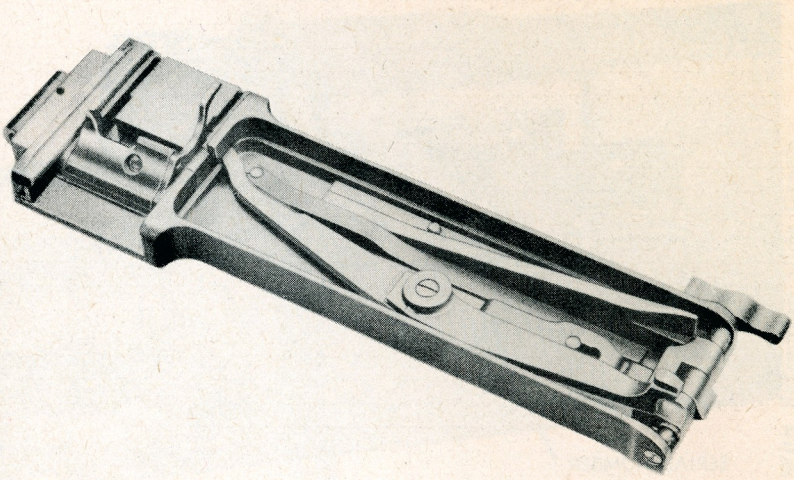

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Figure 9 — Cover Group

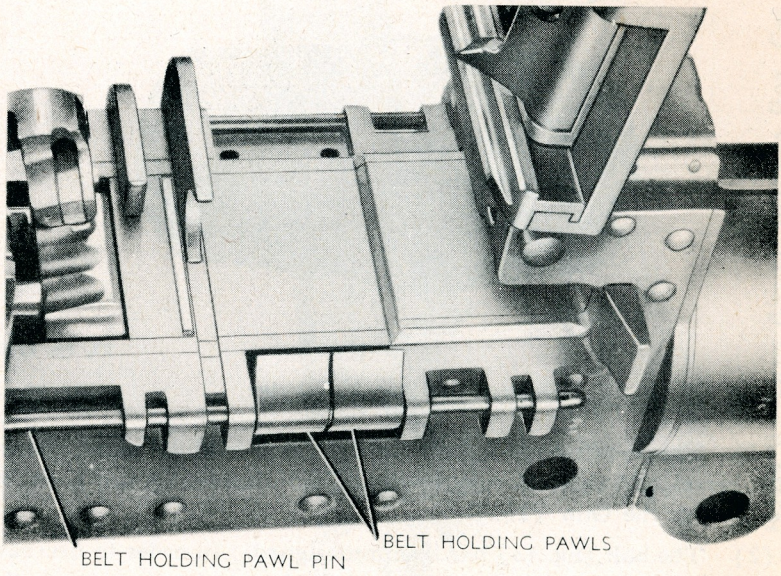

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Figure 10 — Belt Holding Pawls Assembled to Receiver

DESCRIPTION AND DATA

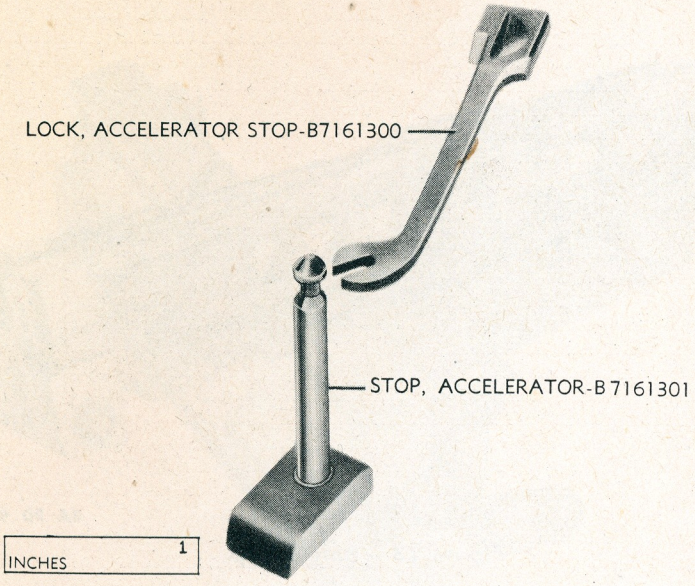

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Figure 11 — Accelerator Stop and Lock (Early Guns T36)

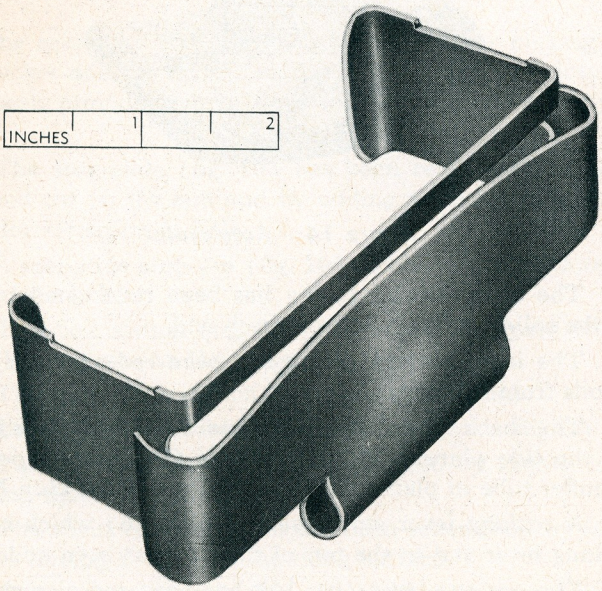

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Figure 12 — Short Round Stop

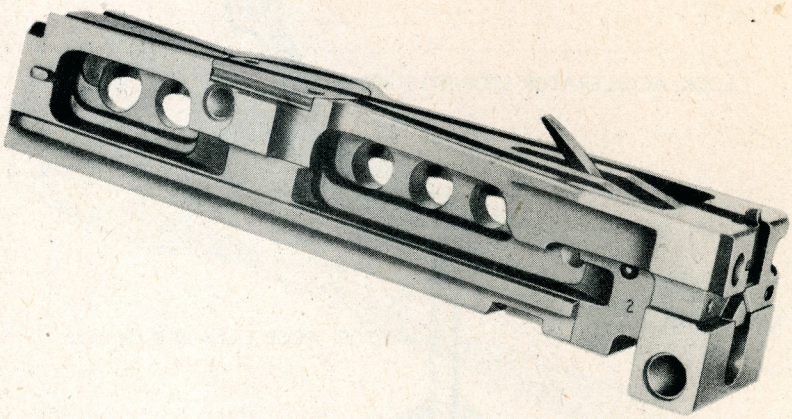

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Figure 13 — Bolt Group

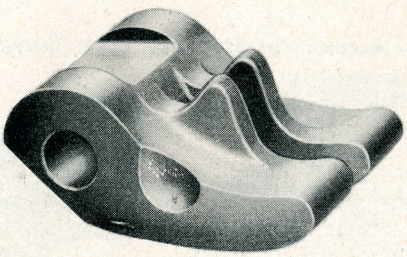

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Figure 14 — Accelerator

(4) The outer driving spring has been redesigned by removing two of the solid wound coils from each end.

(5) The inner driving spring has been redesigned by removing three coils from each end.

(6) The back plate (fig. 15) has been redesigned to clamp around the side plates. Washer springs (Belleville type) are used in the buffer tube in place of fiber disks used in the Gun M2.

(7) A cocking lever stop assembly (fig. 16) which is housed in the cocking lever slot in the top of the bolt has been added.

(8) The cocking lever (fig. 16) has been redesigned to provide thicker cross sections and to eliminate sharp corners. In addition, a shoulder has been added to the lever to facilitate assembly.

DESCRIPTION AND DATA

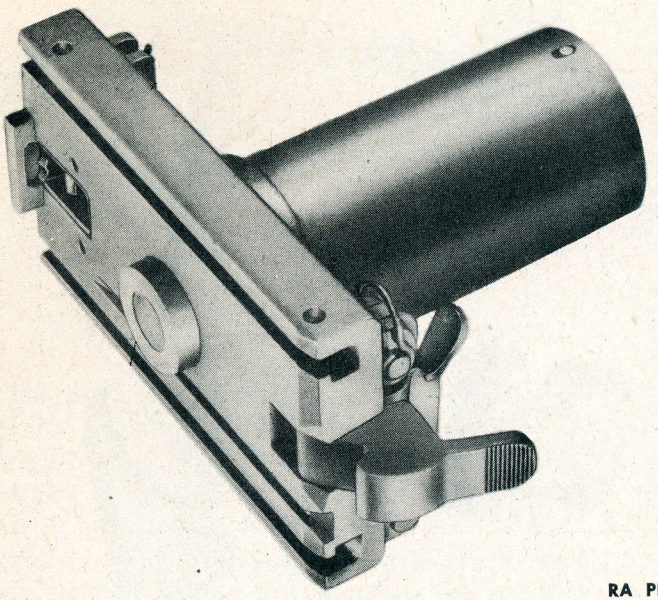

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Figure 15 — Back Plate Group

(9) The sear (fig. 16) has been redesigned by making the top left side thicker and the tip stiffened with a rib. In addition, a larger fillet has been provided where the hook joins the main body of the sear.

(10) The sear slide (fig. 16) has been redesigned to eliminate the V-shaped cut on the end and by adding an elongated slot on the other end for retention in bolt.

(11) A sear slide stop pin (fig. 16) has been added to retain the sear slide in the bolt.

(12) The bolt switch (fig. 16) has been redesigned to provide an interlocking tongue on the under side.

(13) The side plate switch has been redesigned.

(14) The side plate switch spring has been made slightly heavier.

(15) The extractor cam has been modified by slightly changing its shape and making it much wider.

(16) The cover extractor cam has been redesigned by forming a steeper cam having a concave camming surface.

(17) The barrel extension (fig. 17) has been changed by providing additional clearance cuts for the ejector, and the depressor slots are milled across the entire side.

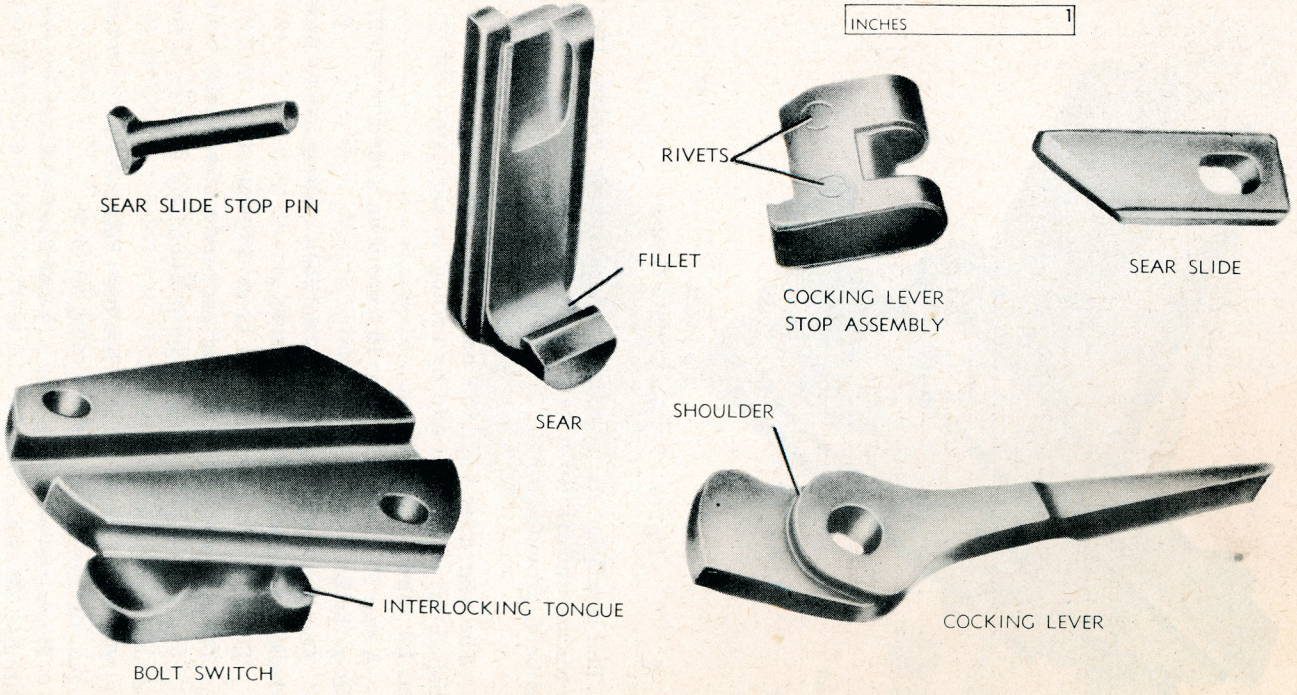

Figure 16 — Bolt Group Parts

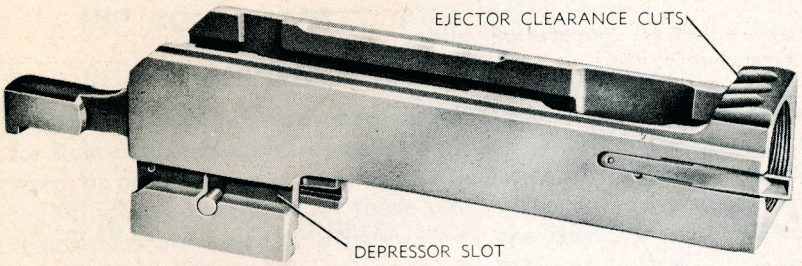

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Figure 17 — Barrel Extension Group

(18) The extractor assembly (figs. 67 and 68) has been redesigned so that the position of the ejector may be shifted to facilitate feeding from the left side of the gun.

(19) A new air and washer spring type barrel buffer is used in place of an oil buffer assembly (fig. 77).

(20) The breech lock depressors are securely fastened to the side plates. On the Gun M2 the depressors are attached to the oil buffer body. The depressors have a curved camming surface formed on the front end.

(21) The breech lock cam has been changed to add a radius at the top of the camming step.

6. TABULATED DATA.

a. Data Pertaining to Machine Guns, Cal. .50, T36 and T25E3.

(1) GENERAL.

	T36	T25E3
Weight of basic gun (including bolt handle and cartridge stop)	62 lb	62 lb
Weight of accessories:		
Operating slide group assembly	1.62 lb	
Retracting slide group assembly	3.13 lb	3.13 lb
Back plate with spade grips	3.88 lb	
Fixed back plate (included in weight of basic gun)	2.56 lb	5.68 lb
Weight of barrel	9.8 lb	9.8 lb
Length over-all	57.25 in.	58.25 in.

BASIC AIRCRAFT MACHINE GUNS, CAL. .50, T36 AND T25E3

	T36	T25E3
Length over-all (operating slide extended)	66.5 in.	
Length of barrel	36 in.	36 in.
Rifling:		
Length	31.91 in.	31.91 in.
Number of grooves	8	8
Twist (direction)	Right hand	Right hand
Twist (one turn in)	15 in.	15 in.
Operation	Short recoil	Short recoil
Feed	Disintegrating link belt	Disintegrating link belt
Capacity of feeding device	As desired	As desired
Sights	Not furnished by Ordnance Department	
Firing pin release:		
Pressure applied to sear	10-20 lb	10-20 lb
Pressure applied to sear slide	30-35 lb	30-35 lb
Cooling	Air	Air
Ammunition	For complete ammunition data, see section XXVI	

(2) PERFORMANCE.

Rate of fire	850-950 rounds per minute	1,200 rounds per minute
*Maximum number of rounds which can be fired consecutively without cook-off before cooling	150 rounds	150 rounds
Average accuracy life	5,000 rounds	5,000 rounds

*See cook-off data in paragraph 21 c.

Section III

TOOLS, PARTS, AND ACCESSORIES

7. ORGANIZATIONAL SPARE PARTS.

a. A set of organizational spare parts is supplied to the using arm for field replacement of those parts most likely to become broken, worn, or otherwise unserviceable. The set will be kept complete by requisitioning new parts for those used. The authority upon which requisitions are based is SNL A-38 for the Basic Aircraft Machine Gun, Cal. .50, T36 and SNL A-67 for the Basic Aircraft Machine Gun, Cal. .50, T25E3.

SPARE PART	DRAWING NO. OR PIECE MARK
For Basic Aircraft Machine Gun, Cal. .50, T36	
ACCELERATOR	C8141
ARM, belt feed pawl	B7161702
BAR, trigger	B257592
BARREL, assembly	D7161580
BOLT, alternate feed, assembly	B147463
BOLT, breech lock cam	A152938
COLLAR, driving spring rod	A152900
DISK, buffer	A152835
EJECTOR	B7161735
EXTENSION, barrel, assembly	C4082
EXTENSION, firing pin, assembly	B8976
EXTRACTOR, assembly	B7161734
GUIDE, oil buffer spring, assembly	B8782
LATCH, back plate	B8949
LATCH, cover	B8928
LEVER, cocking	B9718A
LEVER, feed belt	D7161712
LOCK, accelerator stop	B7161300
LOCK, back plate latch	B147464
LOCK, breech	B7161302
LOCK, oil buffer tube, assembly	C145325
LOCK, spring, oil buffer body	A9266
LOCK, trunnion block	A13565
NUT, breech lock cam bolt	A152939
NUT, oil buffer piston head	A9267
NUT, switch pivot	A13556
PAWL, belt holding, right- and left-hand, w/sleeve, group assembly	B7162034
PAWL, cover detent, w/spring, assembly	B7313070
PAWL, feed belt, assembly	B7312641
PIECE, filler, lower	A152750
PIN, accelerator, assembly	B8790
PIN, back plate latch	A9275
PIN back plate latch lock spring	A262799
PIN, belt feed pawl, assembly	B7312643

BASIC AIRCRAFT MACHINE GUNS, CAL. .50, T36 AND T25E3

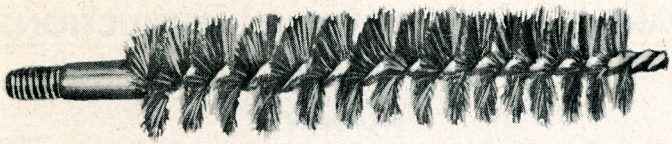
SPARE PART	DRAWING NO. OR PIECE MARK
For Basic Aircraft Machine Gun, Cal. .50, T36 (Contd.)	
PIN, belt feed slide retainer, assembly	B7312642
PIN, belt holding pawl, assembly	B7160030
PIN, breech lock, assembly	B8784
PIN, cocking lever assembly	B147762
PIN, cotter 1/8 x 5/8 phosphate (cover pin)	427229
PIN, cotter 1/8 x 1 1/2 phosphate (breech lock cam bolt)	137205
PIN, cotter 1/16 x 3/4 phosphate (cover detent pawl)	137146
PIN, ejector	A7161736
PIN, firing	B7310080
PIN, locking	A7312517
PIN, stop, driving spring rod collar	A152898
PIN, stop, firing pin spring	A9382
PIN, trigger bar, assembly	B7310073
PLUNGER, adjusting screw	A152839
PLUNGER, belt feed lever	A13515
RETAINER, belt feed slide	B7161705
SCREW, adjusting	A152834
SEAR	C4067
SLIDE, feed, belt, assembly	B7312639
SLIDE, sear	A351220
SPRING, adjusting screw plunger	A9300
SPRING, back plate latch	A9356
SPRING, back plate latch lock	B243607
SPRING, belt feed lever plunger	A13516
SPRING, belt feed pawl, inner	A9352
SPRING, belt feed pawl, outer	A7312677
SPRING, belt holding pawl	A7160628
SPRING, cartridge alining pawl	A13613
SPRING, cover extractor	B7161711
SPRING, cover latch	B8931
SPRING, ejector	A9523
SPRING, firing pin	A9353
SPRING, locking barrel	B8908
SPRING, oil buffer	B9832
SPRING, sear	A9524
SPRING, switch	B7312637
STOP, accelerator	B7161301
STOP, cartridge, front	A13539
STOP, cartridge, rear	A13540
STOP, short round	B7312635
STRIPPER, link	A131541
STUD, bolt	A13424
SWITCH	B147461
SWITCH, bolt	C4062

TOOLS, PARTS, AND ACCESSORIES

SPARE PART	DRAWING NO. OR PIECE MARK
For Basic Aircraft Machine Gun, Cal. .50, T25E3	
ACCELERATOR	C7312679
ARM, belt feed pawl	B7161702
BARREL, assembly	D7161580
BOLT, alternate feed assembly	B7312765
BOLT, breech lock cam	A152938
COLLAR, driving spring rod	A152900
EJECTOR	B7312695
EXTENSION, barrel, assembly	C7312760
EXTENSION, firing pin, assembly	B7312769
EXTRACTOR, assembly	C7312668
GUIDE, buffer spring, assembly	B8782
LATCH, back plate	B7312676
LATCH, cover	B8928
LEVER, cocking	B7312705
LEVER, feed, belt	D7161712
LOCK, back plate latch	B147464
LOCK, barrel buffer tube, assembly	C145325
LOCK, breech	B7161302
LOCK, ejector pin	A7312694
LOCK, spring, barrel buffer body	A9266
LOCK, trunnion block	A13565
NUT, breech block cam bolt	A152939
NUT, switch pivot	A13556
PAWL, belt holding, right- and left-hand	B7162034
PAWL, cover detent, w/spring, assembly	B7313070
PAWL, feed, belt, assembly	B7312641
PIECE, filler, lower	A152750
PIECE, filler, sear spring	A7312763
PIN, accelerator	A7312707
PIN, back plate latch	A9275
PIN, back plate latch lock spring	A262799
PIN, belt feed pawl, assembly	B7312643
PIN, belt feed slide retainer, assembly	B7312642
PIN, belt holding pawl	B7312862
PIN, breech lock, assembly	B8784
PIN, buffer piston	A7312662
PIN, cocking lever	A7312706
PIN, cotter $\frac{1}{8}$ x $\frac{5}{8}$ phosphate (cover pin)	427229
PIN, cotter $\frac{1}{8}$ x $1\frac{1}{2}$ phosphate (breech lock cam bolt)	137205
PIN, ejector	A7312693
PIN, firing	B7312712
PIN, sear slide stop	A7312708
PIN, stop, driving spring rod collar	A152898
PIN, stop, firing pin spring	A9382
PISTON, barrel buffer	A7312686
PLUNGER, adjusting screw	A7312671
PLUNGER, belt feed lever	A13515

BASIC AIRCRAFT MACHINE GUNS, CAL. .50, T36 AND T25E3

SPARE PART	DRAWING NO. OR PIECE MARK
For Basic Aircraft Machine Gun, Cal. .50, T25E3 (Contd.)	
RETAINER, back plate latch lock pin	A7312674
RETAINER, belt feed slide	B7161705
RETAINER, buffer valve	A7312688
ROD, buffer piston, assembly	B7312682
ROD, driving spring, w/spring, assembly	C7312692
SCREW, adjusting	A7312672
SEAR	C7312751
SLIDE, feed belt, assembly	B7312639
SLIDE, sear	A7312709
SPRING, adjusting screw plunger	A7312665
SPRING, back plate latch	A9356
SPRING, back plate latch lock	B243607
SPRING, belt feed lever plunger	A13516
SPRING, belt feed pawl, inner	A9352
SPRING, belt feed pawl, outer	A7312677
SPRING, belt holding pawl	A7160628
SPRING, bolt switch stud	A9524
SPRING, buffer	B9832
SPRING, buffer valve	A7312664
SPRING, cover extractor	B7161711
SPRING, cover latch	B8931
SPRING, ejector	A7312667
SPRING, firing pin	A9353
SPRING, locking, barrel	B8908
SPRING, sear	A9524
SPRING, switch	B7312637
SPRING, washer, back plate buffer	A7312675
SPRING, washer, buffer	A7312687
STOP, cartridge, front	A13539
STOP, cartridge, rear	A13540
STOP, cocking lever, assembly	B7312699
STOP, ejector lock pin	A7312698
STOP, sear, assembly	B7312752
STRIPPER, link	A13541
STUD, bolt	A13424
STUD, bolt switch	A13529
SWITCH	B7312646
SWITCH, bolt	C7312703
TUBE, barrel buffer, assembly	B7312764
VALVE, barrel buffer piston	A7312689



RA PD 102102

Figure 18 — Cleaning Brush, Cal. .50, M4 (C4037)

8. ACCESSORIES.

a. Accessories include tools and equipment as required by personnel for disassembling and assembling, and for the cleaning and preserving of the gun, ammunition, etc. Accessories should not be used for purposes other than as prescribed and, when not in use, should be properly stored.

b. The accessory provided with each weapon is listed below. If it becomes necessary to replace a broken or missing accessory, this list should be checked with pertinent SNL which is the authority for requisitioning.

ACCESSORY	PIECE MARK OR FED. STOCK NO.	FIG. NO.	USE
For Basic Aircraft Machine Guns, Cal. .50, T36 and T25E3			
BRUSH, cleaning, cal. .50, M4	C4037	18	Clean bore of gun.

PART TWO — OPERATING INSTRUCTIONS

Section IV

GENERAL

9. SCOPE.

a. Part two contains information for the guidance of the personnel responsible for the operation of this equipment. It contains information on the operation of the equipment with the description and location of the controls.

Section V

SERVICE UPON RECEIPT OF EQUIPMENT

10. GENERAL.

a. Upon receipt of new or used materiel, it is the responsibility of the officer in charge to ascertain whether it is complete and in sound operating condition. A record should be made of any missing parts and of any malfunctions, and any such conditions should be corrected as quickly as possible.

b. Attention should be given to small and minor parts, as these are the more likely to become lost and may seriously affect the proper functioning of the materiel.

11. NEW AND USED EQUIPMENT.

a. When received from storage, the Guns T36 and T25E3 will in most cases be Saran packed. With this type of packing, the application of rust-preventive compound (heavy) has been discontinued, making it possible for the gun to arrive at its destination ready for use without disassembling, degreasing, or lubricating. Description of this method of packing is as follows:

(1) Each gun is enclosed in sealed, moistureproof envelopes, and packed in a wooden box on a wooden cradle. A drying agent contained in a tubular carrier, called the drier container, which surrounds the barrel jacket, has been placed within the moistureproof envelopes to absorb any moisture which may eventually enter.

(2) Each gun has been thoroughly lubricated with preservative lubricating oil (special), and needs no further oiling and no degreasing before firing; however, where it is expected that the gun will be required to fire at sub-zero temperatures, the parts should be wiped

with a clean, lintless, slightly oiled cloth and then completely wiped with a dry, clean, lintless cloth, prior to installation of the gun. Thereafter, the gun must be watched very closely for rust, and cleaned and reoiled as frequently as necessary.

NOTE: *Bore and chamber must be wiped dry of oil before firing or combat use.*

(3) Each gun has been correctly headspaced and test-fired from both right- and left-hand sides. The gun is ready for use, except for the reassembly of the gun components for feeding ammunition from either right- or left-hand sides, and attaching and adjusting the accessory equipment.

(4) The absence of heavy grease on the gun parts allows them to move quite freely during shipment and handling; therefore, a sharp blow on the end of the box is likely to move the bolt sufficiently to cock the gun. To prevent this, an oil-impregnated hardwood block has been placed in the receiver behind the bolt. This block must be removed before the gun is installed.

b. In those cases where guns are received from storage coated completely with rust-preventive compound they must be disassembled and thoroughly degreased. Before degreasing, disassemble the gun to the extent described below.

(1) Remove the cover group components and clean each of them individually (par. 93).

(2) Remove the black plate group (par. 52).

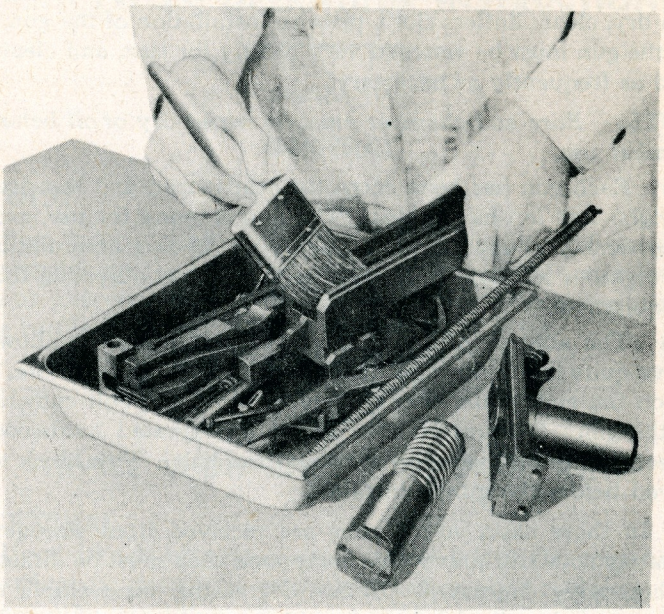
(3) Remove and disassemble the bolt group (pars. 61 and 63) and clean components individually. The firing pin spring must be removed from the firing pin extension, and the spring, firing pin extension, and its tunnel in the bolt should be cleaned thoroughly. Clean the extractor assembly, taking particular care to clean the recesses around the ejector thoroughly. It is not recommended that the ejector be removed.

CAUTION: *After cleaning the bolt, visually inspect the firing pin tunnel and the hole for the driving spring rod with springs assembly and make certain all grease has been removed. All grease must be removed from the driving springs also.*

(4) Detach the buffer body from the barrel extension and remove the oil buffer assembly (or barrel buffer) from the body. Remove the accelerator and the tube lock assembly from the buffer body (secs. XVIII and XIX).

CAUTION: *Make sure that solvent is not allowed to enter the barrel buffer tube (Gun T25E3).*

(5) Unscrew the barrel extension from the barrel and take out the breech lock (par. 85).



RA PD 80250

Figure 19 — Using a Bath for Cleaning Small Parts

(6) Remove the switch and switch spring, the belt holding pawl, cartridge stops, and link stripper. Disassemble the right-hand rear cartridge stop assembly (Gun T36) for cleaning (par. 98). Extreme care must be taken to insure that all parts of the receiver and barrel are thoroughly degreased.

NOTE: *The breech lock cam should not be removed for cleaning purposes. The coils of all springs and the recesses in which springs and plungers operate must be thoroughly degreased.*

(7) The following means may be used in removing the rust-preventive compound:

(a) Dry-cleaning Solvent. It is recommended that excess compound be scraped from the parts prior to the use of solvent. Remove the remaining rust-preventive compound with dry-cleaning solvent. Rag swabs wet with solvent may be used to clean large parts, and a bath of the solvent may be used for small parts. Suitable brushes may be used if available (fig. 19). After cleaning with solvent, all parts should be wiped thoroughly dry with a clean, lintless cloth. To avoid leaving finger marks which ordinarily are acid and induce corrosion, wear gloves when handling parts after they have been cleaned. Dry-cleaning solvent attacks and discolors rubber.

SERVICE UPON RECEIPT OF EQUIPMENT

CAUTIONS:

1. Never use a solution of water and lye or any other caustic to clean gun parts.

2. Weak alkaline cleaning solutions such as those containing soda ash, soap, or borax will be used on phosphate surfaces (commercially known as Parkerized and distinguished by a dull black or approaching black color only when dry-cleaning solvent is not available, because of the difficulty of removing all traces of the alkali after cleaning. Proportions shown in step *(b)* below, may be used.

3. Never use carbon tetrachloride, nor trichlorethylene or perchlorethylene except in commercial degreasers, as these solvents may cause rust. Gasoline and benzine are prohibited as they present a fire hazard.

4. Cleaned parts must be oiled immediately, as prescribed in paragraph 36 **b** (2) *(d)*, to prevent corrosion.

(b) Boiling Water Containing Soap, Soda Ash, or Borax.

1. Disassemble the gun and place all the small parts in a wire basket. Lower the basket, as well as the barrel, receiver, and barrel jacket, into the boiling water until completely submerged. Skim the compound off the top of the water at frequent intervals to insure that particles of the compound will not adhere to the clean gun parts when they are removed from the bath. Remove the parts from the bath after approximately one-half hour, immediately rinse in clear warm water, and oil for rust prevention as explained in step 2, below. Preparation of hot water cleaning solution and materials to be used are explained in steps *3* to *6*, below.

2. After degreasing and thoroughly rinsing, dry thoroughly all gun components, as well as the receiver and barrel jacket, with lintless wiping cloth or dry, compressed air if available. (Compressed air, unless special filters are used, will contain moisture.) Then dip all the gun components, including barrel, receiver, and barrel jacket, in preservative lubricating oil (special) if the gun is to be placed into immediate use, or preservative lubricating oil (medium) if it is to be temporarily stored. If gun is to be placed into immediate use, excess oil should be wiped from all parts, including barrel, receiver, and barrel jacket, with lintless wiping cloth and lubricated, as explained in paragraph 33.

3. Hot water cleaning solutions may be prepared with various materials, such as soda ash, soap, borax, and alkaline cleaning compounds. Recommended proportions are indicated below. Hot water solutions have certain limitations when used to degrease guns with a phosphate finish, such as Parco-lubrite or "Parkerizing." Strong alkaline cleaners will deteriorate phosphate finishes to the extent that the corrosion-preventive quality will be reduced or removed. Mild

soaps and weak alkaline solutions may be used without harmful results, however, provided they are followed with a very thorough rinsing in clear, hot water to completely remove all traces of the alkaline materials which may promote corrosion or deterioration of the finish.

4. Practical experience indicates that increasing the temperature of a hot water solution provides greater degreasing efficiency than increasing the amount of materials used therein. Best results are obtained with a temperature of 180 to 200° F.

5. When it is desired to use hot water cleaning methods to degrease phosphate finished guns or parts, any one of the materials in proportions indicated below can safely be used. No other materials will be used without approval of competent authority.

Borax—6 to 10 ounces to each gallon of water.

Soda ash—Not more than ½ ounce to each gallon of water.

Castile soap or issue soap—Not more than 2 ounces to each gallon of water.

6. For degreasing guns and parts not phosphate finished, any one of the following materials in proportions indicated below may be used.

Borax—½ to 1 pound to each gallon of water.

Soda ash—½ to 1 pound to each gallon of water.

Castile or issue soap—¼ pound to each gallon of water.

Alkaline cleaning compound—⅓ pound to each gallon of water.

NOTE: *Alkaline cleaning compound will not be used in any proportion to degrease guns with a phosphate finish.*

Section VI

CONTROLS

12. GENERAL.

a. Controls for all wing guns and synchronized guns are furnished by the Army Air Forces. In some aircraft installations Guns T36 are mounted flexibly and are equipped with a back plate assembly with spade grips. Controls for flexible Guns T36 are described in the following paragraphs. No provision is made for a flexible mounting for the Gun T25E3.

13. TRIGGER.

a. A butterfly-shaped trigger is located on the back plate between the spade grips (fig. 20). The trigger is a lever which, when depressed, releases the firing mechanism which fires a cartridge.

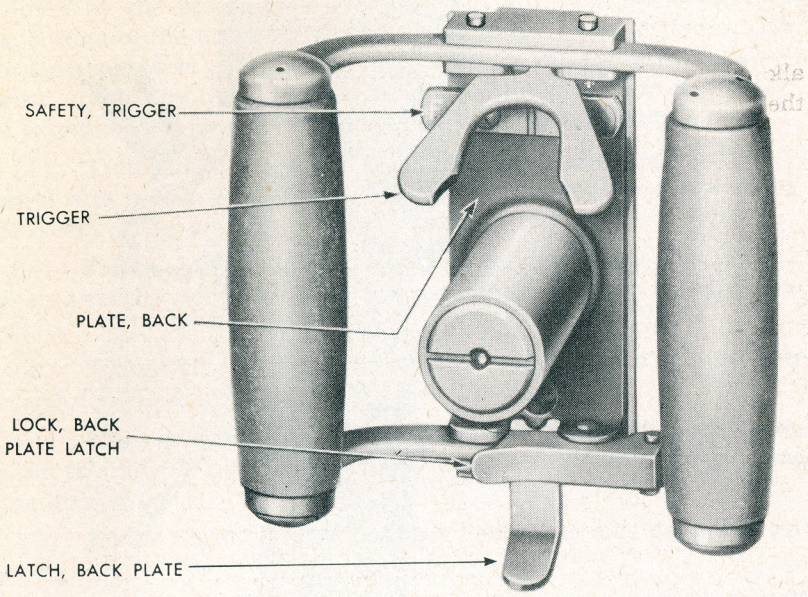


Figure 20 — Spade Grip Back Plate Assembly

14. SAFETY.

a. The safety is located on the back plate below the trigger (fig. 20) and operates laterally when manually pushed, and blocks or releases the trigger for firing. The letter "S" is stamped on the right and "F" on the left end. These letters indicate "safe" and "fire." When moved to the right so that the letter "S" can be seen, it is in the safe position and when moved to the left so that the letter "F" can be seen, it is in the fire position.

Section VII

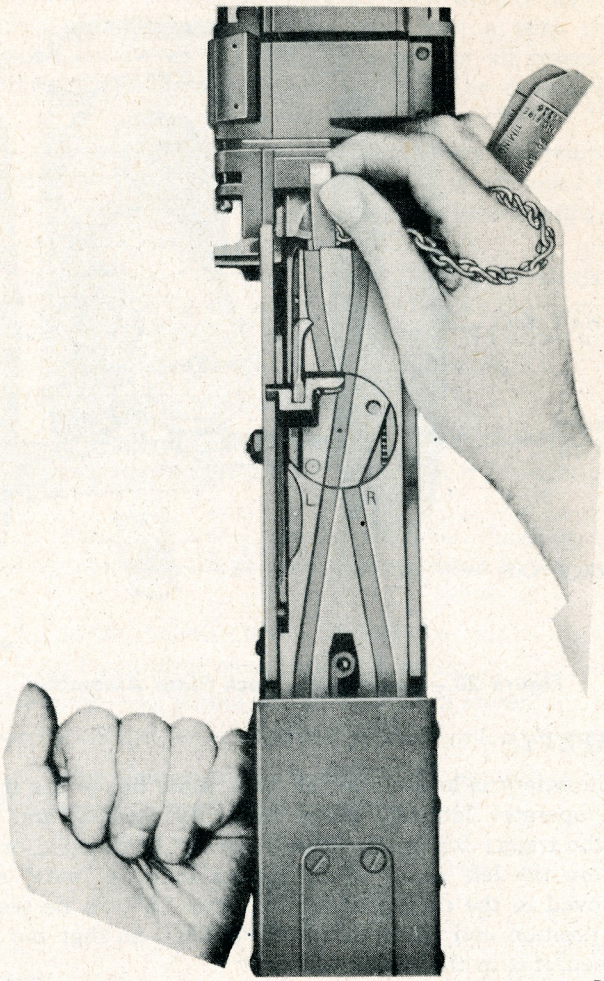
OPERATION UNDER USUAL CONDITIONS

15. EMPLACING.

a. Aircraft machine guns are emplaced in mounts furnished by the Army Air Force and covered in Army Air Force manuals.

16. HEADSPACE.

a. Definition. The headspace of a military weapon with the cartridge fully seated in the chamber is the distance between the base



RA PD 73892

Figure 21 — Checking Headspace Adjustment

of the cartridge and the face of the bolt. In aircraft machine guns, headspace is adjusted by obtaining the proper distance between the forward part of the bolt and the rear end of the barrel.

b. Significance. When any cartridge is fired, the powder gases exert tremendous pressure in the chamber. This pressure forces the bullet out of the barrel; it also tends to force the cartridge case out of the chamber. The cartridge case, therefore, must be held snugly in the chamber from the time the round is fired until the bullet leaves the barrel. It is held there by the forward face of the bolt pressing

against the rear face of the cartridge, the bolt being locked in this position by the breech lock. The breech lock engages a recess in the bottom of the bolt and locks it firmly to the barrel extension. As the recoiling parts move into battery after recoil, the breech lock is forced upward by the breech lock cam and locks the bolt to the barrel extension and just before they reach the battery position.

(1) TIGHT HEADSPACE. If the parts have been improperly adjusted with too little headspace, the bolt is held too far rearward by the barrel. This may cause the following:

(a) Failure of the recoiling parts to go completely into battery because the breech lock cannot fully enter the locking recess of the bolt.

(b) Failure to fire because the bolt may not go forward far enough for the sear to be released.

(c) Sluggish fire because of binding and excessive friction between the moving parts (particularly noticeable when pulling a long ammunition belt).

(2) LOOSE HEADSPACE. Too much headspace may cause the following:

(a) Rupture or separation of the cartridge case because the bolt is not far enough forward to hold the cartridge snugly in the chamber.

(b) Inability to obtain proper timing.

(c) Poor shot patterns because of escape of powder gases at the breech. In synchronized guns, excessive headspace contributes to a fluctuation of the zero shot.

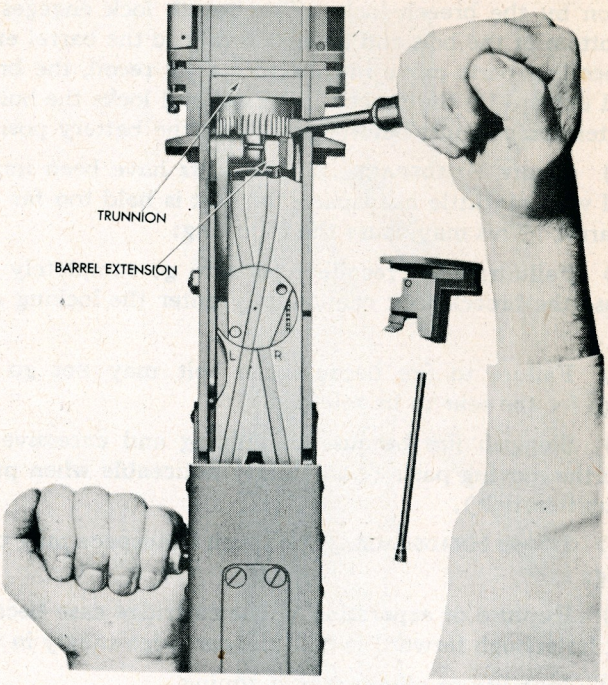
(d) Battering of the breech lock, bolt, and barrel extension because the locking surfaces of the breech lock and bolt recess are not in contact at the instant of firing. This will soon render these parts unfit for service.

(e) Battered T-slot lips due to the bolt striking the barrel extension.

c. When and How To Adjust Headspace. The gun must be headspaced each time it is assembled. The adjustment must be made after the parts are assembled into the gun. The only approved method for headspacing Basic Aircraft Machine Guns, Cal. .50, T36 and T25E3 is the following:

(1) Pull the bolt back about 1 inch by means of the bolt handle or the extractor.

(2) Screw the barrel into the barrel extension (by applying a screwdriver to the notches on the rear end of the barrel (fig. 22)), until the recoiling parts will not go into battery position without being



RA PD 73890

Figure 22 — Screwing Barrel Into Barrel Extension

forced when the bolt is released. The recoiling parts are in battery when the barrel extension touches the trunnion block.

NOTE: *For ease in screwing the barrel into the barrel extension, remove the right-hand rear cartridge stop assembly (Gun T36).*

(3) Screw the barrel out of the barrel extension one notch at a time until the recoiling parts will just go into battery position when the bolt is released, but not forced forward.

NOTE: *Do not retract the bolt more than 1 inch when determining the point at which the recoiling parts will just go into battery without being forced.*

(4) When this point is found, retract the bolt and unscrew the barrel two more notches.

d. When and How To Check Headspace. If a headspace gage is available, check the headspace each time it is adjusted, prior to test firing on the ground; after installation of the gun in an airplane, prior to each take-off of the airplane; and at any other time that the correctness of headspace is doubted. Headspace gage A351211 ("GO"

and "NO-GO") is used to check the headspace of Aircraft Browning Machine Gun, Cal. .50, M2. This gage is a part of the headspace and timing gage assembly 41-G-201-175 (fig. 30). To check headspace proceed as follows:

(1) Cock the gun by fully retracting the recoiling parts and allowing them to return to battery position. This cocks the firing pin.

(2) Retract the bolt until the barrel extension and trunnion block are separated approximately one-sixteenth inch. This puts the locking surfaces of the breech lock and bolt in contact, which is the position they will assume when a cartridge is chambered.

(3) Insert the "GO" end of the headspace gage in the T-slot between the face of the bolt and the end of the barrel. If the gage does not go in, the headspace is too tight; correct the adjustment by unscrewing the barrel, one notch at a time, checking with the gage each time, until the gage enters (fig. 21).

(4) Attempt to insert the "NO-GO" end of the headspace gage in the T-slot between the face of the bolt and the end of the barrel. If the no-go end of the gage goes in, the headspace is too loose; correct the adjustment by screwing the barrel into the barrel extension one notch at a time, checking with the gage each time, until the no-go end of the gage will not enter. If the gage does not go in and the check for tightness outlined in step (3), above, is satisfactory, the headspace is correct.

(5) Remove the gage and release the firing pin.

CAUTION: *Never release the firing pin with the gage in place, as to do so will damage the firing pin.*

(6) NOTES.

(a) If the headspace obtained by the method of adjustment given in step c, above, is not between the go and no-go limits of the gage, change the headspace to suit the gage.

(b) The gage may be inserted from either the top or bottom of the gun. In the event the gage is inserted from the bottom, the slack between the bolt and the breech lock may be taken up by inserting a screwdriver in the T-slot between the face of the bolt and the end of the barrel. The gage is made narrow so that this is possible.

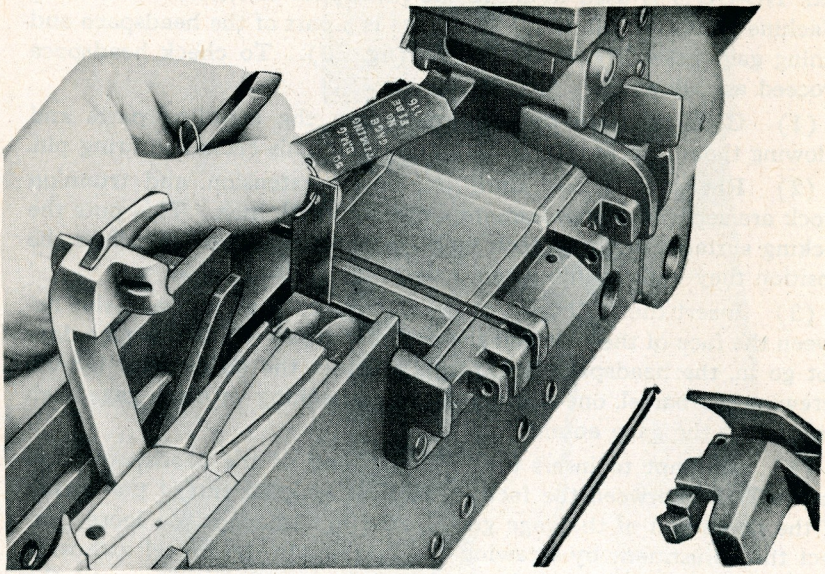
17. CHECK AND ADJUST TIMING.

a. Check timing to insure that the guns will not fire too late, as follows:

(1) Check headspace (par. 16).

(2) Cock the gun by fully retracting the recoiling parts and allowing them to go forward into battery.

(3) Raise the cover and retract the bolt slightly (¼ in.).



RA PD 73893

Figure 23 — Checking Timing

(4) Insert the fire (0.020-in.) timing gage 41-G-201-175 (fig. 30) between the barrel extension and the trunnion block, as shown in figure 23.

(5) Allow the barrel extension to close slowly on the gage.

(6) Release the firing mechanism by operating *once* the solenoid or trigger bar. The firing pin *should* release smartly. If the firing pin is *not released,* the solenoid protrusion or the trigger bar must be adjusted until the firing pin can be released with the "FIRE" gage in place.

NOTE: *A trigger bar is not furnished with the Gun T25E3.*

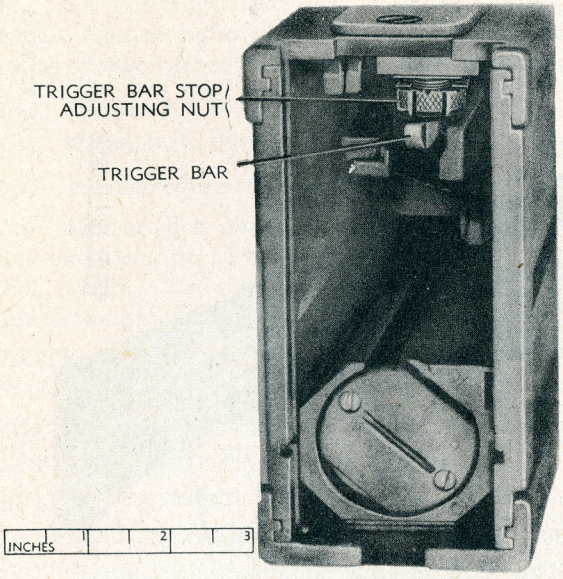
(7) To adjust the trigger bar (Gun T36), remove the back plate and turn the trigger bar stop adjusting nut to the right one notch at a time until the firing pin can be released with the fire gage in place (fig. 24).

CAUTION: *Take care to prevent the toe of the trigger bar from touching the top of the bolt.*

b. Check timing to insure that the guns will not fire too early, as follows:

(1) Remove the fire timing gage, cock the gun, and insert the no-fire (0.116-in.) gage 41-G-201-175 (fig. 30) between the barrel extension and the trunnion block.

OPERATION UNDER USUAL CONDITIONS



RA PD 49038

Figure 24 — Adjustable Trigger Bar Stop Assembly — Assembled in Receiver

(2) Allow the barrel extension to close slowly on the gage.

(3) Release the firing mechanism *once*. The firing pin *should not* be released.

(4) If the firing pin *is* released with the no-fire gage in place, the solenoid protrusion or the trigger bar must be adjusted to obtain the desired results.

(5) To adjust the trigger bar (Gun T36) remove the back plate and turn the trigger bar stop adjusting nut to the left one notch at a time until the firing pin cannot be released with the no-fire gage in place (fig. 24).

NOTE: *Synchronized guns need not be checked for timing unless failures to feed because of poor timing are encountered during actual firing.*

18. CHANGING FEED (GUN T36).

a. In order to change the gun from left-hand feed to right-hand feed, or vice versa, repositioning of parts must be carried out in the bolt group, cover group, and certain parts in the receiver, as shown in figure 25.

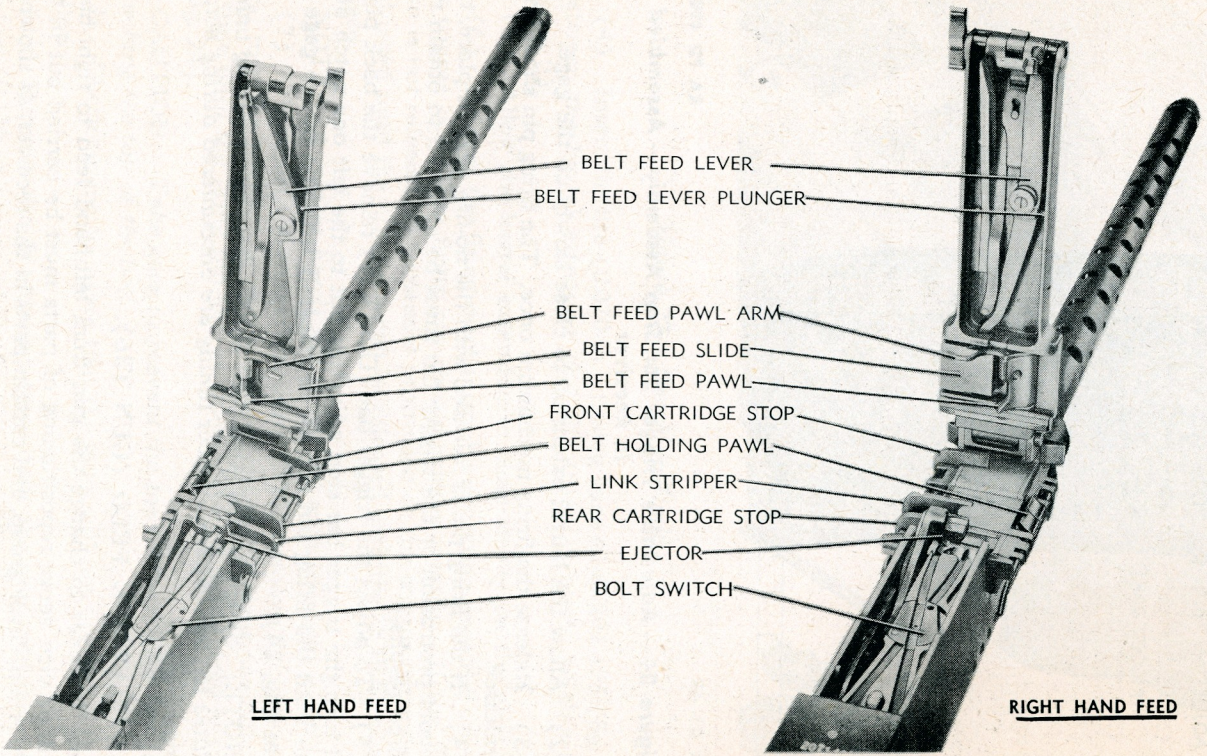


Figure 25 — Position of Parts for Left- and Right-hand Feed

OPERATION UNDER USUAL CONDITIONS

b. The following describes, in general terms, the change from left-hand feed to right-hand feed. By reversing the process the gun may be changed from right-hand feed to left-hand feed.

(1) BOLT GROUP.

(a) Remove the bolt group from the gun (par. 59 **a**).

(b) Remove the extractor assembly from the bolt (par. 61 **a**).

(c) Lift up bolt switch high enough to clear bolt switch stud; rotate one-half turn so that bolt switch stud enters the opposite hole in bolt switch. The cam groove in the bolt switch will then line up to make the groove in the bolt marked "R" (right) continuous.

NOTE: *When assembled for right-hand feed, the enlarged portion of the bolt switch is toward the rear of the bolt.*

(d) Assemble the extractor assembly to the bolt and replace the bolt group in the receiver (par. 60 **a**).

(2) COVER GROUP.

(a) Open the cover and remove the short round stop (par. 93 **a**).

(b) Remove the belt feed slide retainer and the belt feed slide assembly from the cover (par. 93).

(c) Remove belt feed lever (par. 93 **d**) and transfer the belt feed lever plunger and spring from the upper hole (cover open) in the belt feed lever to the lower hole.

(d) Replace belt feed lever (par. 94 **d**).

(e) Reverse the belt feed slide assembly and replace it in its way in the cover with the pawl end of the slide toward the right. Replace belt feed slide retainer.

(f) Push the slide to the right and hold it so that the belt feed pawl pin can be pushed out of place, and remove the belt feed pawl, belt feed pawl arm, and springs from the slide. Take care not to lose the springs.

(g) Reposition the belt feed pawl by turning it over so that the hole on the opposite side alines with the stud for the belt feed pawl springs. Reverse the belt feed pawl arm by turning it over.

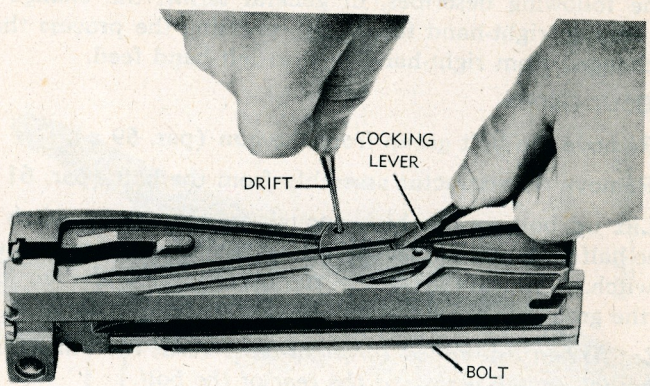
(h) Reassemble the belt feed pawl, arm, and springs to the belt feed slide by inserting the belt feed pawl pin.

(i) Replace the short round stop over the belt feed slide retainer.

(3) RECEIVER GROUP.

(a) Remove the belt holding pawl pins from the right- and left-hand side plates.

(b) Take out the front cartridge stop and move it to the left-hand side. Remove the right-hand rear cartridge stop assembly and assem-



RA PD 95347

Figure 26 — Moving Bolt Switch

ble the rear cartridge stop and link stripper to the left side of the receiver.

(c) Assemble the belt holding pawls, springs, and sleeve to the right-hand side (par. 99).

19. CHANGING FEED (GUN T25E3).

a. The following describes, in general terms, the change from left-hand to right-hand feed. By reversing the process, the gun may be changed from right-hand feed to left-hand feed (fig. 25).

(1) BOLT GROUP.

(a) Remove the bolt group from the gun (par. 59 **a**).

(b) Remove the extractor assembly from the bolt (par. 63 **a**).

(c) Remove the cocking lever from the bolt (par. 63 **b**).

(d) Depress the spring-loaded switch stud using a drift and, using the cocking lever as a tool (fig. 26), rotate the switch until the stud engages the opposite hole. The cam groove in the bolt switch will then line up to make the groove in the bolt marked "R" (right) continuous. Replace cocking lever in bolt.

NOTE: *When assembled for right-hand feed, the enlarged portion of the bolt switch is toward the rear of the bolt.*

(e) Remove the ejector from the extractor (par. 63 **a**) and reverse it so that the claw is on the right side (fig. 67). Reverse ejector spring so that it is on the opposite side of the ejector pin from the ejector claw.

(f) Reassemble ejector (par. 64 **j**), assemble the extractor assembly to the bolt (par. 64 **h**), and replace the bolt group in the receiver.

OPERATION UNDER USUAL CONDITIONS

NOTE: *The square end of the sear slide must be on the side from which the weapon is to be fired. If necessary, reposition the sear slide, sear slide stop pin, and cocking lever pin on the opposite side of the bolt (par.* 64 **j**).

(2) Reposition cover group components, as outlined in paragraph 18 **b** (2).

(3) Reposition receiver group components, as outlined in paragraph 18 **b** (3).

NOTE: *The right-hand rear cartridge stop assembly is not used on Gun T25E3.*

20. LOADING.

a. Loading may be considered to include two distinct operations: entering the loaded belt properly into the feedway, and then operating the mechanism of the gun until the action is closed with a cartridge in the chamber and with a cartridge in the feedway gripped by the extractor for extraction from the belt on the next recoil stroke.

b. The cover should be closed before the first round is fed into the feedway and should remain closed as long as ammunition is being fed.

c. Enter the *double-loop* end of the belt through the feed opening until the first cartridge is beyond the belt holding pawl. Retract the bolt fully by means of the retracting slide, operating slide, hydraulic charger, or cable attachment, and allow the bolt to go forward freely. This places the first cartridge in the belt in position in the feedway where it is gripped by the extractor.

d. The second operation consists of pulling the bolt once again completely to the rear and releasing it. This action places a cartridge in the chamber, and the extractor grips the next cartridge in the belt. The gun is now fully loaded and cocked, ready to fire when the sear is depressed.

CAUTION: *Hand charging of a second unfired cartridge should be held to a minimum, as explained in paragraph* 42 **a.**

21. FIRING.

a. Guns Equipped With a Back Plate Having a Manual Trigger (fig. 20), and Guns Equipped With Adapters Having the Trigger Supplied as Part of the Adapter. Guns of this type are fired by pressing the trigger forward.

b. Guns Equipped With Back Plate Having No Manual Trigger. Guns of this type are fired by means of a solenoid assembly or by a synchronized mechanism, which are furnished by the Army Air Force and covered in Army Air Force manuals.

BASIC AIRCRAFT MACHINE GUNS, CAL. .50, T36 AND T25E3

c. Permissible Bursts of Automatic Fire.

(1) The following table indicates maximum bursts which may be fired in Aircraft Machine Gun, Cal. .50, T36 or T25E3 without danger of cook-off.

(2) Combat firing is unrestricted, but bursts of longer duration than 150 rounds (10-sec bursts in the Gun T36, and 7-sec bursts in the Gun T25E3) decrease accuracy and may lead to a stoppage due to overheating.

Initial or Primary Burst (Rounds)	Secondary Burst (Rounds)	Cooling Interval Between Bursts (Seconds)	Maximum Number of Secondary Bursts Which May Be Fired Without Danger of Cook-off
10	10	30	21
15	15	30	10
15	15	60	14
25	25	60	6
50	50	30	2
50	50	60	2
75	20	60	5
75	15	60	10
75	10	60	40
100*	—	—	—
150*	—	—	None

22. UNLOADING.

a. Lift the cover, raise extractor, and remove ammunition belt.

b. Lower extractor, retract the bolt sufficiently to remove the round in the chamber, and make visual inspection of the feedway, T-slot, and chamber to make sure that the gun is unloaded. Release the bolt and lower the cover.

c. If *certain* that the gun is completely unloaded, release the firing mechanism to allow the firing pin spring to drive the firing pin forward and relieve tension on the firing pin spring.

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*The maximum single burst which may be fired without danger of cook-off is 150 rounds. Therefore, if firing 100-round bursts, only 1 such burst may be fired without danger of cook-off. Before firing another 100- or 150-round burst, the gun should be allowed to completely cool.

CAUTION: *If an overheating burst is fired, the gun should be cleared within 10 seconds after completion of the burst. If the gun cannot be cleared within 10 seconds, the round should be allowed to remain in the chamber a minimum of 5 minutes, making sure the gun is aimed in the opposite direction from personnel and equipment. If an attempt is made to clear the gun between the 10-second and the 5-minute period, the extracted cartridge may explode outside the weapon causing serious injury to personnel or equipment.*

Section VIII

OPERATION UNDER UNUSUAL CONDITIONS

23. GENERAL.

a. When operated under unusual conditions, where extremes of temperature and humidity occur, special care should be observed with regard to the cleaning, oiling, and lubrication of the guns. Such care is most necessary to insure proper operation and functioning of the mechanisms, and to guard against excessive wear of the moving parts and deterioration of the materiel.

24. COLD CLIMATES.

a. In temperatures below freezing, it is necessary that the moving parts of the machine gun be kept absolutely free from moisture. Excessive oil on the working parts will solidify to such an extent as to cause sluggish operation and functioning or complete failure. This applies, in particular, to the firing mechanism and small spring-operated parts. Special care should be taken to eliminate all grease, excess oil, and fouling from the following parts and assemblies:
Belt feed pawl and holding pawl springs and seats.
Bore and chamber of the barrel.
Driving spring group and tunnel in bolt.
Feed lever plunger spring and seat.
Firing pin group and pin tunnel in bolt.
Switch.

b. If guns are left mounted in the airplanes, the exposed parts should be carefully covered for protection and to prevent frosting.

c. When guns are removed from the airplane and taken into heated buildings for cleaning, adjustment, or repair, they should be allowed to come to the temperature of the building before cleaning. Immediately after they reach room temperature, they should be disassembled, and all moisture should be thoroughly wiped from the parts and bore with a dry cloth to prevent rusting. The guns should then be thoroughly cleaned with dry-cleaning solvent, as explained in paragraph 33 **f**, and then oiled, as explained below.

(1) If guns are to be remounted in the airplane immediately, they should be oiled lightly according to temperature conditions, as outlined in paragraph 33 and explained in step (2), below. If guns are not to be mounted in the airplane immediately, preservative lubricating oil (special) should be used to prevent rusting, and the guns should be inspected every 5 days. Before mounting guns in the airplane for combat, oil should be thoroughly removed with dry-cleaning solvent and the gun should be lightly reoiled according to temperature conditions, as outlined in paragraph 33 and explained in step (2), below. Great care should be used to insure the removal

of all excess oil from the guns, especially from moving parts, firing pin, and driving springs and tunnels in bolt in which they operate, switch, springs and spring seats, and like places. Excess oil will congeal at low temperatures and cause sluggish action or even malfunction of the gun.

(2) After oiling with the prescribed oil, as explained in paragraph 33, the moving parts should be wiped dry and the *contacting surfaces* then lightly lubricated, according to temperature conditions, as outlined in paragraph 33 **b**, using a lightly oiled cloth. The bore and chamber should be wiped completely dry of oil before firing or mounting guns for combat.

25. HIGH-ALTITUDE FLIGHTS.

a. When airplanes are operated in moderate climates at high altitudes where extremely low temperatures are encountered, condensation of moisture may occur on the guns when returned to ground temperature. In such cases guns should be inspected, disassembled, dried, cleaned, oiled, and lubricated as prescribed for guns operated in cold climates, as explained in paragraph 24. When high-altitude flights are anticipated, guns should be lubricated as in cold climates, irrespective of ground temperatures.

26. HOT CLIMATES.

a. In hot climates the thin oil film necessary for aircraft guns under combat conditions will be quickly dissipated. Guns should be inspected frequently and oil film renewed when necessary to prevent rusting and assure the gun being ready for combat when kept mounted in the airplane. Guns should be cleaned frequently to remove dust which will stick to oiled surfaces.

b. Guns should be kept covered as much as possible.

c. Perspiration from the hands is a contributing factor to rusting because it contains acid. When handled, guns should be wiped dry frequently and the oil film maintained.

d. When guns are kept dismounted from the airplane, they should be cleaned and then oiled with preservative lubricating oil (medium). Before mounting guns in airplanes, the oil should be thoroughly removed with dry-cleaning solvent and the guns should be reoiled lightly according to temperature conditions, as outlined in paragraph 33 **b** and explained in paragraph 24.

e. Where humidity is high, special care should be taken to inspect unexposed surfaces such as the bore and chamber, inside of barrel jacket, receiver, springs and spring seats, firing pin, and driving springs tunnel in bolt, and like places where rusting might occur and not be quickly noticed. Screws and pins should be watched to prevent rust attacking them and "freezing" them in place.

DEMOLITION TO PREVENT ENEMY USE

27. EXCESSIVELY SANDY OR DUSTY CONDITIONS.

a. In localities where dust and sand storms are prevalent, guns should be kept carefully covered at all times, whether mounted in the airplanes or not. Dust and sand will enter the mechanism and bore and stick on oiled surfaces, forming a gummy paste which may clog the gun and cause malfunction. This paste will also act as an abrasive and will cause undue wear of the moving parts of the gun.

b. Under such conditions, guns should be removed from the airplane as often as practical and thoroughly cleaned and reoiled. Oiling should be confined to moving parts and contacting surfaces and should be as light as possible for proper functioning of the gun.

c. After a dust or sand storm, guns should be disassembled and thoroughly cleaned, inspected, and reoiled, as above. All oil should be wiped from the bore and chamber before firing or mounting the gun in the airplane for combat.

28. EXCESSIVELY MOIST OR SALTY ATMOSPHERE.

a. Salt air is conducive to quick rusting as the salt has a tendency to emulsify the oil and destroy its rust-preventive qualities. When mounted in the airplane, guns should be kept lightly oiled and inspected frequently and treated in a manner similar to that prescribed for guns in hot climates in paragraph 26.

b. If guns are not kept mounted, they should be thoroughly cleaned and oiled with preservative lubricating oil (special or medium) according to the length of time they are to be inactive. If preservative lubricating oil (special) is used, guns should be inspected every 5 days. Inspection should be thorough, with particular attention to unexposed parts as prescribed in paragraph 26 **c**.

c. Before mounting guns in the airplane, they should be thoroughly cleaned with dry-cleaning solvent to remove all heavy oil, and then reoiled according to temperature conditions as outlined in paragraph 33 **b**. Bore and chamber should be wiped dry of all oil before firing or mounting gun in plane for combat.

Section IX

DEMOLITION TO PREVENT ENEMY USE

29. GENERAL.

a. The destruction of the materiel when subject to capture or abandonment in the combat zone will be undertaken by the using arm, only on authority delegated by the division or higher commander as a command function when such action is deemed necessary as a final resort to keep the materiel from reaching enemy hands.

b. Adequate destruction of materiel means damaging it in such a way that the enemy cannot restore it to usable condition in the combat zone, either by repair or cannibalization. Adequate destruction requires that:

(1) Enough parts essential to the operation of the materiel must be damaged.

(2) Parts must be damaged beyond repair in the combat zone.

(3) The same parts must be destroyed on all materiel, so that the enemy cannot make up one operating unit by assembling parts from several partly destroyed units.

30. PROCEDURES FOR DEMOLITION.

a. Remove groups as outlined in part three. Use barrel as a sledge. Raise cover; lay bolt in feedway; lower cover on bolt and smash cover down over bolt. Deform back plate. Lay barrel extension on its side, hold down with one foot, and break off the shank. Deform casing by striking side plates just back of feedway.

PART THREE — MAINTENANCE INSTRUCTIONS

Section X

GENERAL

31. SCOPE.

a. Part three contains information for the guidance of the personnel of the using organizations responsible for the maintenance (1st and 2nd echelon) of this equipment. It contains information needed for the performance of the scheduled lubrication and preventive maintenance services, as well as description of the major systems and units and their functions.

Section XI

SPECIAL ORGANIZATIONAL TOOLS AND EQUIPMENT

32. GENERAL.

a. The following is a list of tools issued per organization.

ACCESSORY	PIECE MARK OR FED. STOCK NO.	FIG. NO.	*USE
For Basic Aircraft Machine Guns, Cal. .50, T36 and T25E3			
BRUSH, chamber cleaning, M6	B108828	27	—
CASE, cleaning rod, M15	C64274	32	—
CHEST, armorer's tool, M1 (w/o contents)	41-C-855-95		—
DRIFT, brass, rd., straight, diam. 3/8 in., over-all length 4 in.	41-D-1470	33	—
DRIFT, assembly (approx. diam. 1/16 in. and approx. length 1 3/8 in.) (This is to be improvised)	—		To drive out the ejector lock pin, ejector lock pin stop, and belt feed lever pin.
EXTRACTOR, ruptured cartridge case, cal. .50	41-E-557-50	29	Remove ruptured cartridge cases.
FILE, A.S., half-rd., cut second, length (point to shoulder) 6 in.	41-F-939		—
FILE, A.S., mill, cut smooth, length (point to shoulder) 6 in.	41-F-1179		—
FILE, A.S., rd., cut second, (point to shoulder) 8 in.	41-F-1317		—
FILE, A.S., three square, cut smooth, length (point to shoulder) 6 in.	41-F-1572		—

*Where the accessory's use is not indicated, the nomenclature is self-explanatory or the accessory has general use.

BASIC AIRCRAFT MACHINE GUNS, CAL. .50, T36 AND T25E3

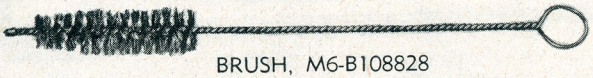
ACCESSORY	PIECE MARK OR FED. STOCK NO.	FIG. NO.	*USE
For Basic Aircraft Machine Guns, Cal. .50, T36 and T25E3 (Contd.)			
GAGE, headspace and timing, cal. .50 (rifle)	41-G-201-175	30	Check headspace and timing of gun.
HAMMER, brass, rd., straight, $1\frac{1}{16}$ in. diam. x $1\frac{15}{16}$ in. length, weight 3 oz.	41-H-169-30		—
HAMMER, lead, weight 2 lb.	41-H-500		—
HAMMER, machinists', ball peen, weight $\frac{1}{2}$ lb.	41-H-521		—
HANDLE, bolt	D8583		For charging the gun.
HANDLE, file and tool, wood, designation med., diam. of hand grip $1\frac{1}{4}$ in.	41-H-1116	33	—
JAW, vise, copper, size 3 in.	41-J-323	28	—
LATCH, cover (special)	B7161236		To facilitate opening of cover.
LINKER-DELINKER, cartridge, hand, cal. .50, M12	D7161200	30	To remove, insert, or aline cartridges.
MACHINE, linking-delinking, cal. .50, M7	D7160003	28	To link or delink cartridges.
OILER, S. (hand), pushed bottom, straight spout, capacity $\frac{1}{2}$ pt., length of spout 4 in.	13-O-1530		—
PLATE, back, spade grip, A.C. conversion group assembly	D35541		—
PLIERS, side-cutting, parallel-jaw, length 6 in.	41-P-1992-6	33	—
PUNCH, center, octagon or rd., knurled, diam. of stock $\frac{3}{8}$ in., length $4\frac{1}{2}$ in.	41-P-3185		—
PUNCH, drive pin, diam. of point 0.03 in., over-all length 3 in.	41-P-3550		—
PUNCH, drive pin, diam. of point 0.05 in., over-all length 3 in.	41-P-3552		—
PUNCH, drive pin, diam. of point 0.08 x $\frac{3}{4}$ in., over-all length 3 in.	41-P-3560		—
REFLECTOR, barrel, cal. .50	41-R-2331-25	28	Inspect bore of gun.
ROD, cleaning, cal. .50, M6	D35442	32	—
ROD, cleaning, jointed, cal. .50, M7	D35441	27	—
ROLL, file, canvas, empty, size 9 x 15 in., No. of pockets 4	41-R-2671-150	32	—

*Where the accessory's use is not indicated, the nomenclature is self-explanatory or the accessory has general use.

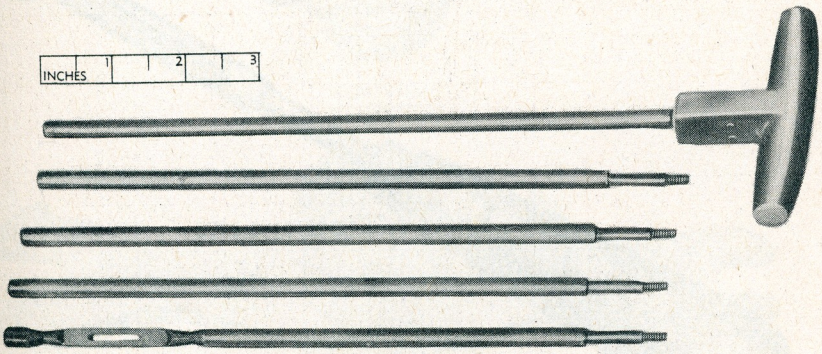
SPECIAL ORGANIZATIONAL TOOLS AND EQUIPMENT

ACCESSORY	PIECE MARK OR FED. STOCK NO.	FIG. NO.	*USE
For Basic Aircraft Machine Guns, Cal. .50, T36 and T25E3 (Contd.)			
ROLL, tool, canvas, empty, armorer's, 24 pockets	D7161569	32	—
SCREWDRIVER, common, normal duty, single grip, length of blade 3 in., width of blade 3/16 in.	41-S-1101	33	—
SLIDE, retracting, group assembly	D73953		—
STONE, sharpening, unmounted, artificial, triangular, size 4 x 7/16 in., type fine	41-S-5495		—
TOOL, firing pin spring removing	41-T-3098	29	Remove the firing pin spring.
VISE, bench, clamp base, jaw opening 3 in., width of jaw 3 in.	41-V-104		—
WRENCH, combination, open end, screwdriver and front barrel openings 3/8 x 3/4 in.	41-W-867-808	31	To measure over - all length of oil buffer assembly and remove oil buffer cap, front barrel bearing, and back plate adjusting screw.

*Where the accessory's use is not indicated, the nomenclature is self-explanatory or the accessory has general use.



BRUSH, M6-B108828

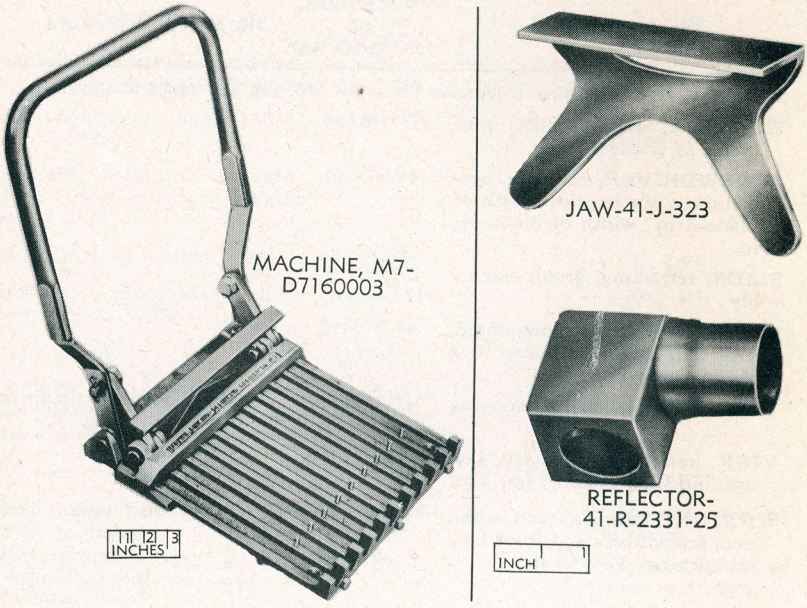


ROD, M7-D35441

RA PD 92473

Figure 27 — Accessories for Machine Gun, Cal. .50, T36 or T25E3

BASIC AIRCRAFT MACHINE GUNS, CAL. .50, T36 AND T25E3



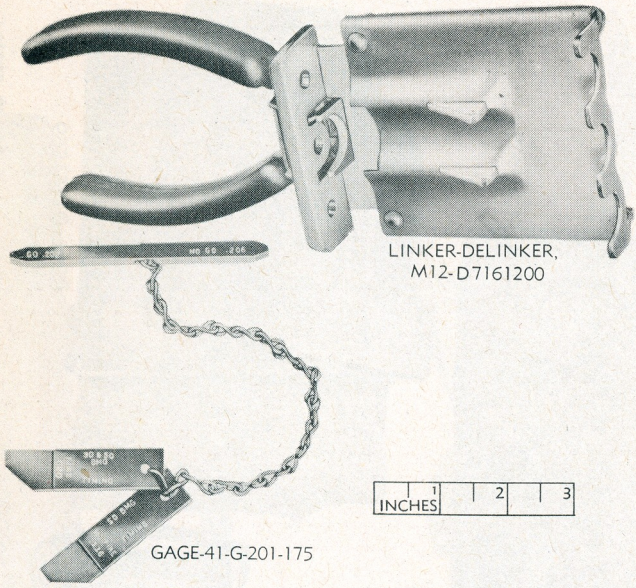
RA PD 102103

Figure 28 — Accessories for Machine Gun, Cal. .50, T36 or T25E3

RA PD 95958

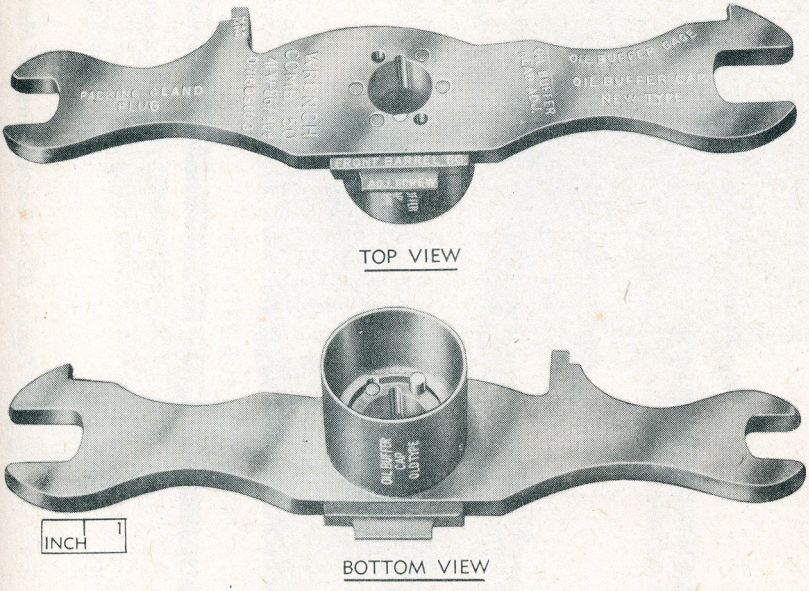
Figure 29 — Accessories for Machine Gun, Cal. .50, T36 or T25E3

SPECIAL ORGANIZATIONAL TOOLS AND EQUIPMENT



RA PD 95959

Figure 30 — Accessories for Machine Gun, Cal. .50, T36 or T25E3



TOP VIEW

BOTTOM VIEW

RA PD 90816

Figure 31 — Combination Wrench, Cal. .50 (41-W-867-808)

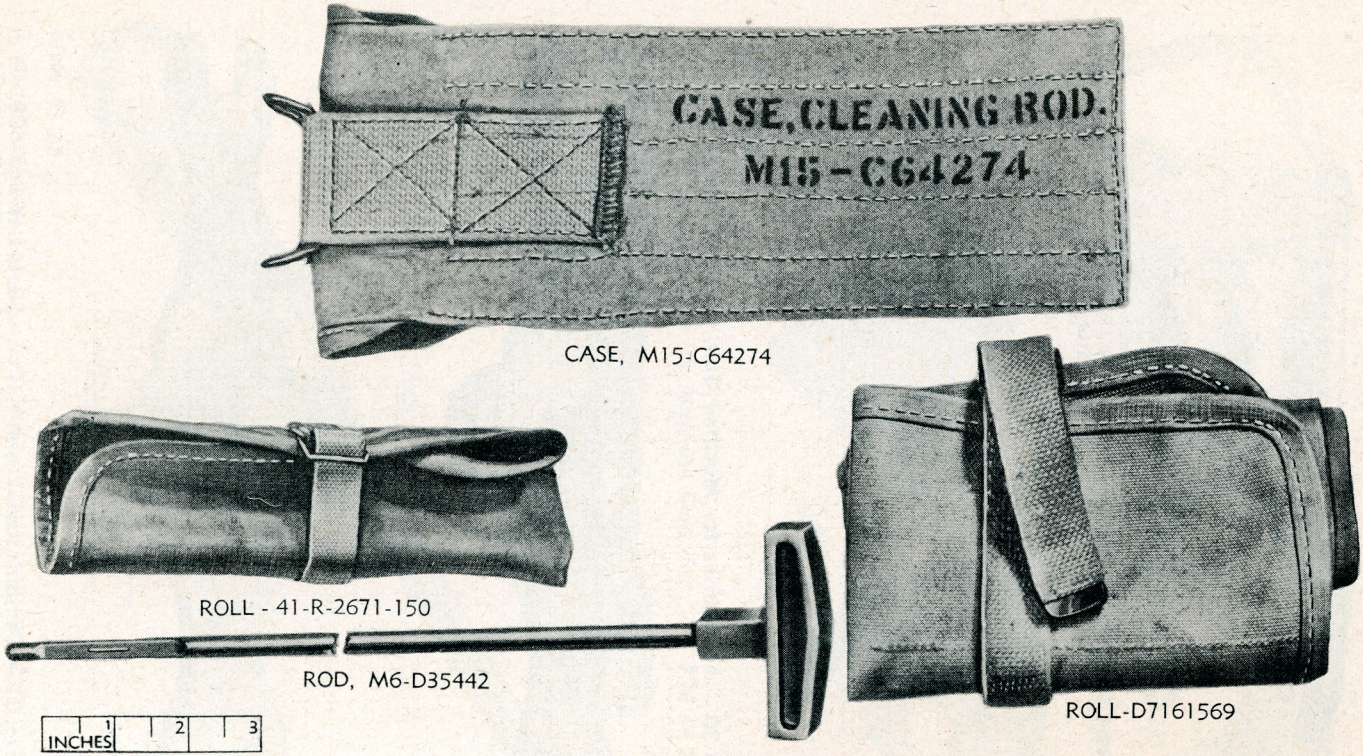


Figure 32 — Accessories for Machine Gun, Cal. .50, T36 or T25E3

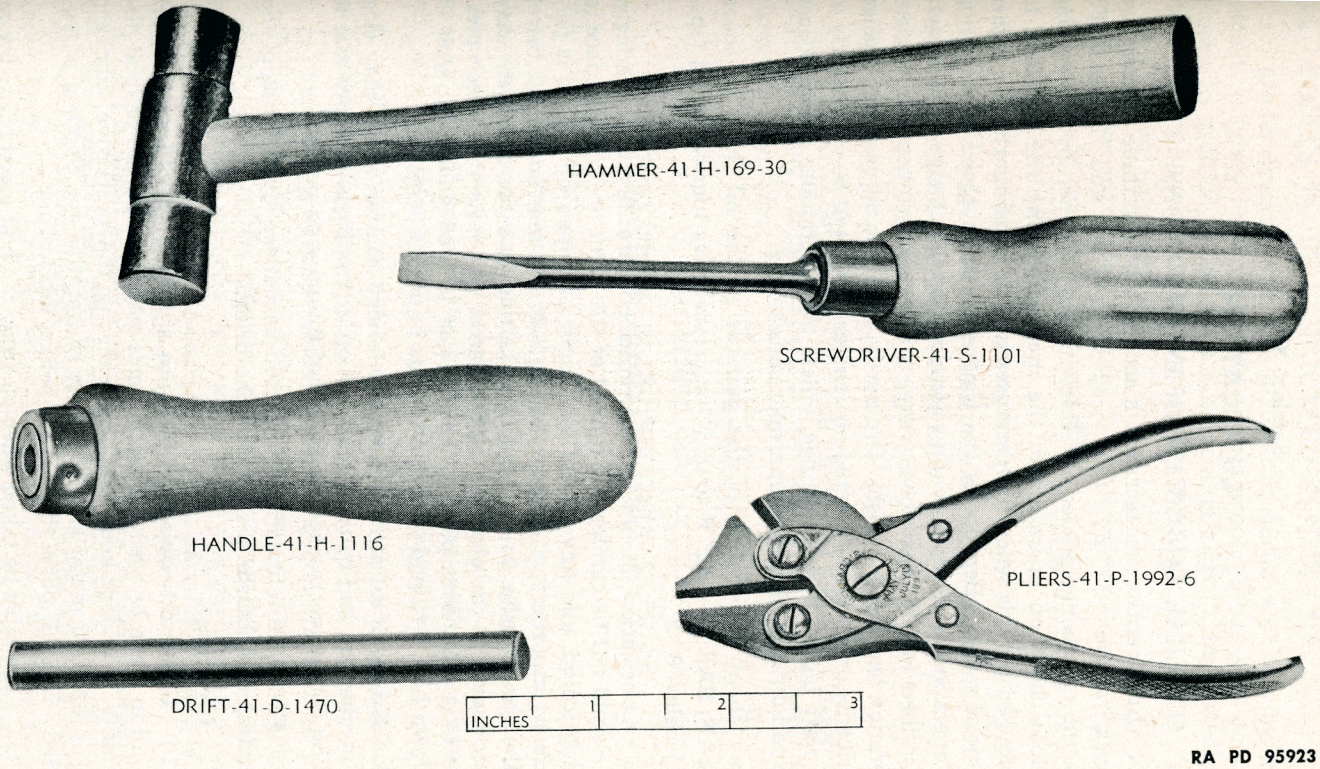


Figure 33 — Accessories for Machine Gun, Cal. .50, T36 or T25E3

Section XII

LUBRICATION

33. GENERAL LUBRICATION INSTRUCTIONS.

a. Lubricants are prescribed in accordance with three temperatu ranges, "above +32° F," "from +32° F to 0° F," and "below 0° F The time to change grades of lubricants is determined by maintainir a close check on operation of the materiel during the approach t prolonged periods when temperatures will be consistently in a high or lower range. Because of the time element involved in preparir for operation at lower prevailing temperatures, a change to lubricant prescribed for the next lower range will be undertaken the momer operation becomes sluggish. Ordinarily, it will be necessary to chang lubricants *only when expected air temperatures will be consistently i the next higher or lower range,* unless malfunctioning occurs soone due to lubricants being of improper consistency.

b. In all lubrication of the gun use engine oil SAE 30 abov +32° F; SAE 10 +32° F to 0° F; or preservative lubricating oil (spe cial) below 0° F.

c. Lubrication should be accomplished carefully and sparingly Oil should *not* be carelessly squirted at the point or on the surface t be lubricated, and any excess oil should be wiped off. This is par ticularly important with regard to the bolt and rear end of the barre of the gun in order to keep oil from getting into the chamber. An oil or grease in the chamber of the barrel will raise the breech pres sure to a hazardous point when the gun is fired and may result i a blown bolt, a ruined gun, and serious injury to personnel.

d. Excess of oil attracts grit and foreign matter which may clo the mechanism and cause a malfunction or stoppage. In any case i will be conducive to excessive wear of the moving parts.

e. Excessive lubrication may often be noticed by smoking of the operating mechanism of the gun when firing.

f. Cleaning.

(1) Unless otherwise specified use dry-cleaning solvent or Diese fuel oil to clean or wash all metal parts whenever partial or total dis assembly is undertaken, or when renewing the protective lubricant film on exposed metal surfaces. Use of gasoline for cleaning is pro hibited. Dry all parts thoroughly before lubricating.

(2) Care must be taken when cleaning the bolt assembly to insure the complete removal of all oil or residue.

PREVENTIVE MAINTENANCE SERVICE

34. POINTS TO BE LUBRICATED IN THE GUN.

a. Under normal conditions all bearing surfaces of moving parts should be lightly lubricated. This is best accomplished with an oiled cloth. In addition to the general lubrication already mentioned, special attention should be given to the following points:

(1) Cover extractor cam.
(2) Cover extractor spring.
(3) Guideways of the belt feed slide.
(4) Cocking lever.
(5) Belt feed lever grooves in the bolt.
(6) Guideways in the barrel extension taking the bolt guides.
(7) Breech lock cam guides and top.
(8) Switch pivot.
(9) Breech lock.

b. The gun should be cleaned and lubricated daily, and before and after firing and during temporary cessation of firing if considerable firing has been done.

Section XIII

PREVENTIVE MAINTENANCE SERVICE

35. GENERAL.

a. Scope. Preventive maintenance services prescribed by Army Regulations are a function of using organization echelons of maintenance. This section contains preventive maintenance service allocated to crew (1st echelon) and scheduled preventive maintenance service allocated to (2nd echelon) organizational maintenance.

b. All lubricants should be removed from the bore and chamber of the barrel before it is fired.

c. Dirt and grit, accumulated in traveling or from blast of piece in firing, settle on bearing surfaces and form a cutting compound. Powder fouling settles between and on operating parts and attracts moisture, preventing proper operation of moving parts and hastening the formation of rust. It is essential that all parts be cleaned at frequent intervals, depending upon use and service.

d. All exposed surfaces, having phosphate or oxide finishes for the prevention of rust, that have become checked, pitted, or rusted shall be thoroughly cleaned with aluminum oxide abrasive cloth or crocus cloth. For cleaning finished and unfinished external surfaces where wear of the parts cleaned will not affect the functioning of the gun, use aluminum-oxide abrasive cloth. For removing rust or stain,

and polishing parts and other finished surfaces of metal, use crocus cloth and oil immediately for protection.

e. Removal of rust from bearing surfaces requires special care in order that clearances shall not be unduly increased. Crocus cloth should be used for this purpose. The use of coarse abrasives is strictly forbidden.

f. When materiel is not in use, the proper covers must be used.

36. PREVENTIVE MAINTENANCE SCHEDULES.

a. Before Firing.

(1) Thoroughly clean the bore and chamber of all dirt, oil, or grease.

(2) Using clean, dry jute burlap, wipe any surplus oil from the bolt, feedway, and cover assembly.

(3) Wipe outer surfaces of the gun with clean, dry jute burlap.

b. After Firing.

(1) BARREL AND CHAMBER. The following procedure is to be followed immediately after firing while the barrel is still warm. It is to be repeated on 3 consecutive days thereafter or until there is no longer any evidence of sweating. The purpose of the repeated swabbing, drying, and oiling operations is to remove the effects of "sweating," a chemical reaction of the burned powder which cannot be removed with the initial procedure.

(a) Clean Bore. Place two clean patches in the slot of the cleaning rod; saturate the patches with rifle bore cleaner, and move it back and forth through the barrel several times. If rust spots or foreign matter are not removed by the bore cleaner, attach the Cleaning Brush M4 to the cleaning rod and scrub the lands and grooves. The chamber cleaning brush should be used to clean the chamber.

(b) Use of Soap and Water or Soda Ash Solution. (This is to be used if rifle bore cleaner is not available.) Place the barrel, muzzle down, in a vessel containing a solution made by dissolving ½ pound of soda ash to each gallon of water. Attach two patches to the cleaning rod, insert rod in the breech end of the barrel, and move it forward and backward for about 1 minute, pumping the solution in and out of the bore through its entire length. If this does not remove rust or foreign matter while the bore is still wet, scrub the lands and grooves of the bore, as well as the chamber, with the Cleaning Brush M4 attached to the cleaning rod. Then using clean patches, pump clean water through the bore. Clean the chamber, using the chamber Cleaning Brush M6. CAUTION: *Do not use dry-cleaning solvent. In the absence of soda ash, a solution of hot water and issue soap may be used, or hot water may be used alone. Dry-cleaning solvent should not be used because the corrosive salts from the primer composition,*

which cause rust, are not readily dissolved by petroleum products; they are readily dissolved by water base solutions.

(c) Dry Bore and Chamber. Place clean dry patches in the slot of the cleaning rod and thoroughly dry bore and chamber.

(d) Oil Bore and Chamber. Using clean dry patches, apply oil to the bore. Use engine oil SAE 30 above +32° F; SAE 10 from +32° F to 0° F; or preservative lubricating oil (special) below 0° F. Apply a light film of oil to the bore by working the patches through the bore.

(2) GROUPS OTHER THAN THE BARREL.

(a) Using rifle bore cleaner, soap and water, or soda ash solution, thoroughly clean the front face of the bolt and the front of the barrel extension as well as all the cover group components which have been exposed to powder gases. Dirt and foreign matter must be removed from all other parts.

CAUTION: *Use special care to remove all fouling from the firing pin hole in the face of the bolt.*

(b) During firing, hard carbon gradually accumulates in the recoil booster and sometimes in the T-slot of the bolt. This carbon deposit must be carefully removed, using a scraper or crocus cloth, and the parts then oiled immediately.

(c) Thoroughly dry all components, using clean, dry jute burlap.

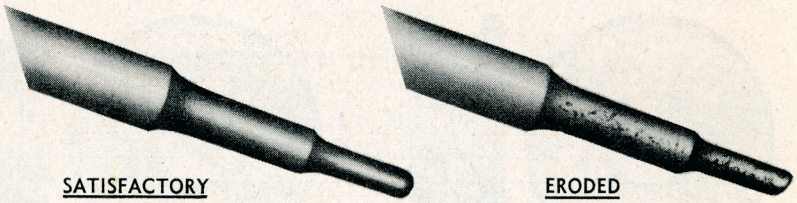
(d) Immediately after cleaning and drying, apply a light coating of oil to all components. Use engine oil SAE 30 above +32° F; SAE 10 from +32° F to 0° F; or preservative lubricating oil (special) below 0° F.

c. Daily Service. Clean the bore and chamber and renew the oil film. Clean component parts, wipe thoroughly dry and reoil.

d. Weekly Service. If the gun has not been fired, clean the bore and chamber with rifle bore cleaner, wipe thoroughly dry, and reoil. Inspect for traces of rust formation.

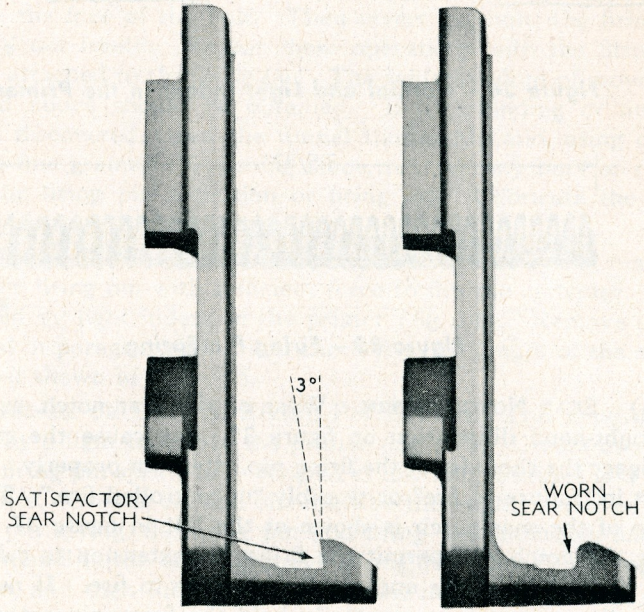
37. PAINTING.

a. Painting is for the purpose of preserving outside surfaces of the gun from which the rustproof finish has been removed by rust, wear, or removal of rust. Such painting is for protection against rusting and to prevent light reflection from worn spots which have become shiny. *Polished parts, or moving parts where wear occurs and where functioning may be affected by application of paint, should not be painted.* Rust should be removed from wearing parts (par. 35 **d**) and then oiled for protection against further rusting. Painting should be done with the utmost care, and application of paint strictly limited to the damaged area. Care should be observed that no paint penetrates to other parts of the gun, or is so applied that it may be rubbed off and cause clogging of the mechanism.



RA PD 95377

Figure 36 — Firing Pin Striker for T36



RA PD 95378

Figure 37 — Sear for T36 (Sear Notch Angle Should Be 4 Degrees for T25E3)

check the free length of the spring by laying the spring on the illustration in figure 39 which shows the exact minimum free length of the spring. If the spring is shorter than the illustration, it should be replaced.

(9) COCKING LEVER BROKEN OR WORN. If the cocking lever is broken, it will fail to cock the gun. If the cocking lever is worn at the area indicated at "A" on figure 40, it may fail to force the firing pin far enough rearward to engage the sear.

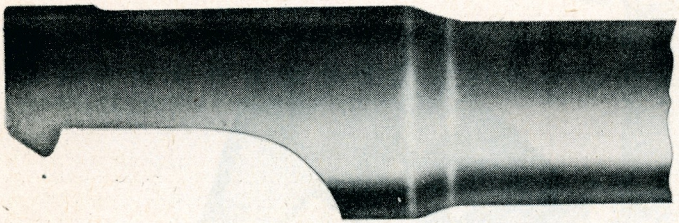


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Figure 38 — Worn Notch on Firing Pin Extension

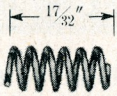

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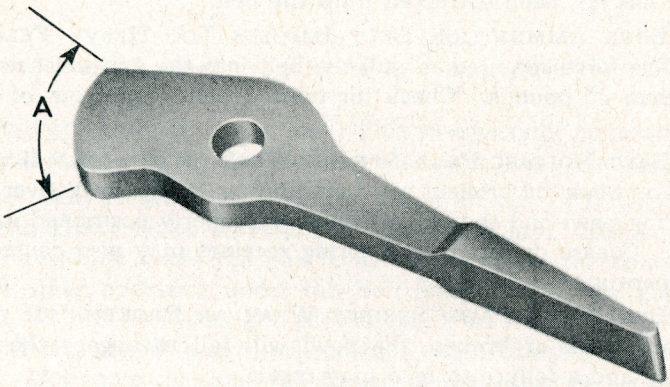
Figure 39 — Sear Spring



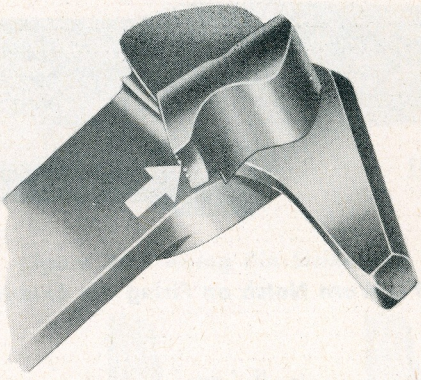
RA PD 73901

Figure 40 — Cocking Lever

39. GUN STOPS FIRING IN BATTERY POSITION WITH NO CARTRIDGE IN THE CHAMBER.

a. This condition is probably caused by one of the following:

(1) BELT FEED LEVER BENT OR BROKEN. This is usually caused by the ammunition belt catching due to misalinement of the ammunition box and chutes with the gun. Check carefully for such misalinement, particularly at the points where the base of the cartridge



RA PD 73905

Figure 41 — Worn T36 Extractor

could catch and stop movement of the belt. The belt feed lever may also be bent or broken if the belt feed pawl arm has been broken and has thus permitted attempted double feeding when a cartridge has not been extracted from the belt.

(2) LONG AMMUNITION BELT IMPOSES TOO HEAVY FEEDING LOAD. The force required to pull the belt into the gun must not be greater than 35 pounds. Check for twisted belt, chutes out of line, etc.

(3) BELT HOLDING PAWL SPRINGS WEAK OR BROKEN. If these springs are weak or broken, the belt links will slip back over the belt holding pawl and the belt will not be properly positioned in the feedway. Grease or dirt in the spring recesses may also cause improper operation of the pawls.

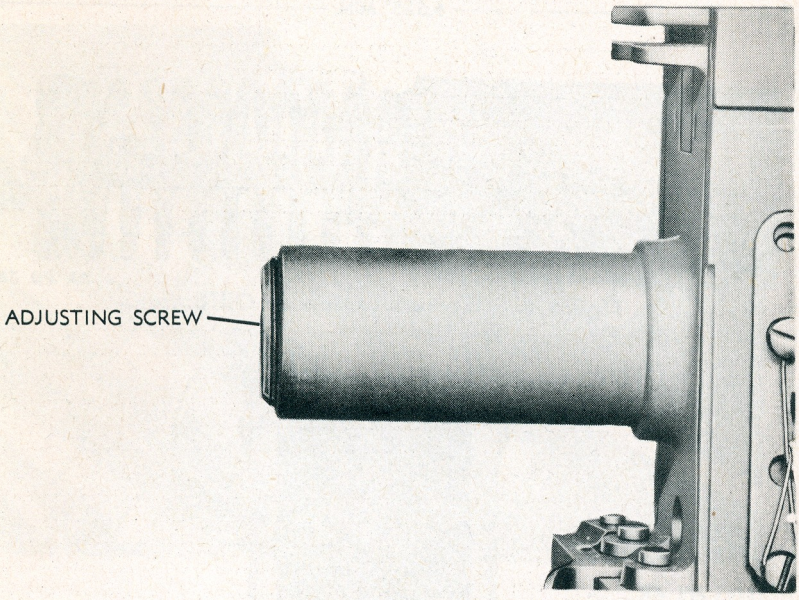
(4) BELT FEED PAWL SPRINGS WEAK OR BROKEN. If these springs are weak or broken, the pawl will fail to engage the belt link firmly and a failure to feed may result.

(5) EXTRACTOR MAY BE BENT, BROKEN, OR DEFORMED SO THAT IT DOES NOT FIT AND SECURELY ENGAGE THE EXTRACTOR GROOVE OF THE CARTRIDGE (fig. 41). Wear at the area indicated may cause failure to extract the cartridge from the belt. A worn extractor should be replaced.

40. GUN STOPS FIRING WITH RECOILING PARTS OUT OF BATTERY POSITION.

a. This condition may be caused by any of the following:

(1) DRIVING SPRINGS WEAK OR BROKEN. Springs in such condition provide insufficient force during counterrecoil to return the re-



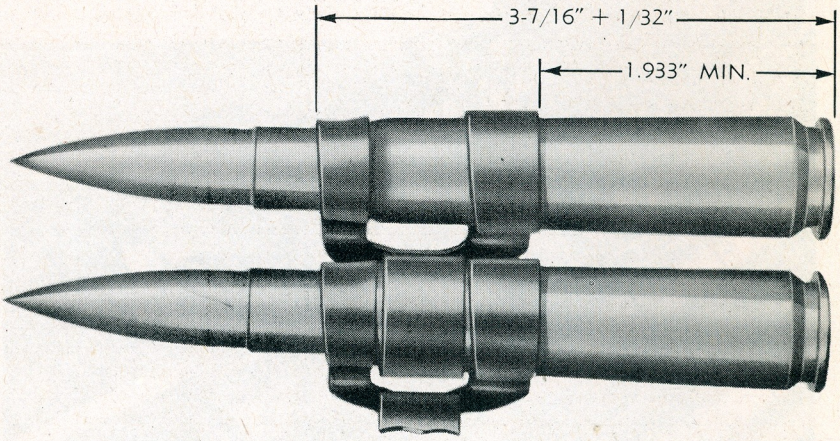
RA PD 39486

Figure 42 — Adjusting Screw in Proper Position (T36)

coiling parts to battery position. This is especially noticeable when the gun is elevated and when it is pulling a long ammunition belt.

(2) ADJUSTING SCREW IN THE BACK PLATE IS LOOSE, OR THE BUFFER DISKS NEED REPLACEMENT (GUN T36). Either of these conditions may cause the gun to fail to complete the counterrecoil stroke when operating under full belt load or when the gun is elevated. When screwed tight, the adjusting screw should project approximately one-sixteenth inch beyond end of the back plate buffer tube. Not more than one full thread of the adjusting screw should be exposed. It may be necessary to add or remove a buffer disk to secure tight adjustment and at the same time meet these requirements. If more than one thread is exposed when the screw is tightened, remove one buffer disk (fig. 42). If adjusting screw is below flush, add one buffer disk. Keep the adjusting screw tight at all times.

(3) BUFFER SPRINGS BROKEN (GUN T25E3). Broken buffer springs may cause the gun to fail to complete the counterrecoil stroke, causing serious damage. Replace any broken springs and make sure that a light film of oil is maintained on each spring (par. 55 f).



RA PD 92004

Figure 46 — Proper Position of Cartridges in the Links

(7) BOLT BINDS AGAINST THE TOP PLATE BRACKET. If the bottom plate is not flat, the bolt will be forced up against the top plate bracket, and may cause the bolt to stop all the way to the rear when operating under full belt load. If the mounting bolts through the rear mounting lugs are drawn too tight, the bottom plate may be sprung upward, as indicated by the exaggerated white dotted line in figure 44, causing the bolt to bind against the bracket.

(8) BOLT STUD BINDING IN THE SLOT OF THE SIDE PLATE. If such binding occurs, the bolt is likely to stop all the way to the rear when operating under full load. Stone the edge of the side plate slot slightly to eliminate interference. If the stud section of the bolt handle or bolt stud is too long, the gun will not function properly because the stud will extend too far into the bolt and prevent movement of the sear. If the stud is too long, it will also force the collar out too firmly against the side plate, causing it to bind and catch in the slot. The distance from the retaining collar to the end of the stud inserted in the bolt should not be more than 0.585 inch.

(9) BREECH LOCK CAM TOO TIGHT. This will cause a binding between the guides of the breech lock cam and the barrel extension. Refer to paragraph 100 **b** for proper adjustment of the breech lock cam.

(10) LINK CATCHES IN THE LINK STRIPPER. With this malfunction, the action stops out of battery position; the parts can be drawn rearward by hand, but cannot be forced forward beyond the point of the stoppage. Inspect the feedway before raising the cover

by looking in at the side where the empty links are ejected; the link will be jammed in the U-shaped opening of the link stripper (fig. 45). In the event that the gun attachments make it impossible to look into the feedway, raise the cover. A distinct click will be heard when the link springs out from the opening in the link stripper. This malfunction may be caused by the following:

(a) Ammunition Loaded Incorrectly in the Links. If the cartridges are not inserted in the proper position in the links, the links may be forced *into* the opening in the link stripper instead of riding in front of it. The correct placement of ammunition in the links is shown in figure 46.

(b) The aperture of the U-shaped opening in the link stripper may be too large.

(c) Ammunition chutes and boxes may be out of position relative to the gun.

(d) Insufficient throw of the belt feed lever due to bending or warpage of the lever.

(11) FIRING PIN HOLE ENLARGED OR THE RECOIL PLATE NOT FLUSH WITH THE FACE OF THE BOLT. If the firing pin hole in the recoil plate is enlarged, the firing pin will not be properly supported and the firing pin will be deformed. If the recoil plate is not flush with the face of the bolt, the primer will not be properly supported at the time of the explosion and the metal of the primer may be forced backward beyond the base of the cartridge forming what is known as an "extruded primer." The projecting surface of the primer will cause the empty case to bind in the T-slot so that ejection cannot take place. On counterrecoil, the front end of the case will strike the barrel or barrel extension and cause the action to stop out of battery position. Replacement of the bolt assembly will correct this condition.

(12) RUPTURED CARTRIDGE CASE IN CHAMBER. A ruptured cartridge case which has not been extracted will stick in the chamber and prevent loading of the following live cartridge. Remove ruptured cartridge case, using the ruptured cartridge extractor (fig. 29) chamber; bore should then be cleaned, and headspace and timing of the gun checked.

41. GUN FIRES TWO SHOTS AND STOPS IN BATTERY POSITION WITH NO CARTRIDGE IN CHAMBER.

a. If this condition continues after repeated chargings, it is probably due to early timing. With early timing, the gun is fired and recoil starts before the extractor has gone forward far enough to engage the cartridge in the feedway; therefore, the gun fires only the cartridge which was charged into the chamber and that cartridge

engaged by the extractor before firing started. Check the timing in accordance with instructions in paragraph 17.

42. BULLET REMAINS IN CHAMBER OR BECOMES LOOSE IN CARTRIDGE CASE WHEN UNFIRED CARTRIDGE IS REMOVED FROM CHAMBER BY HAND EXTRACTION.

a. If the bullet seat in the chamber of the barrel is tight or the cartridge is too long or bullet loose, the bullet may remain in the barrel when an unfired cartridge is extracted from the chamber by hand retraction of the bolt by means of the retracting slide. When such extraction is necessary, the extracted cartridge should be examined to see that the bullet is not loose or missing. Cartridges with loose bullets should be properly disposed of, and if the bullet remains in the barrel, it must be removed and loose powder cleaned from the mechanism before recharging and firing the gun, or else a plugged barrel or burst gun, or both, will result. In most cases, such a malfunction is due to the following conditions:

(1) New barrel with minimum size chamber.

(2) Maximum round.

(3) Loose bullet.

Section XV

BACK PLATE GROUP (GUN T36)

43. GENERAL.

a. The back plate group is attached to the receiver assembly at the rear end of the gun. The rearward stroke of the bolt is stopped as the bolt strikes the buffer plate in the back plate. The buffer disks located in the back plate absorb part of the recoil energy of the bolt.

b. The energy stored in the compressed buffer disks after completion of the recoil stroke helps to force the bolt forward.

44. REMOVAL OF BACK PLATE GROUP.

a. Release the back plate latch lock, pull up on the back plate latch, and slide the back plate up out of the receiver (fig. 47).

45. INSTALLING OF BACK PLATE GROUP.

a. Start the back plate in its slots in the rear end of the receiver side plates, lift the latch lock and latch, and push the back plate assembly all the way down making sure the back plate latch and latch lock are engaged. It may be necessary to push forward on the rear end of the oil buffer tube lock to permit the back plate to

BACK PLATE GROUP (GUN T36)

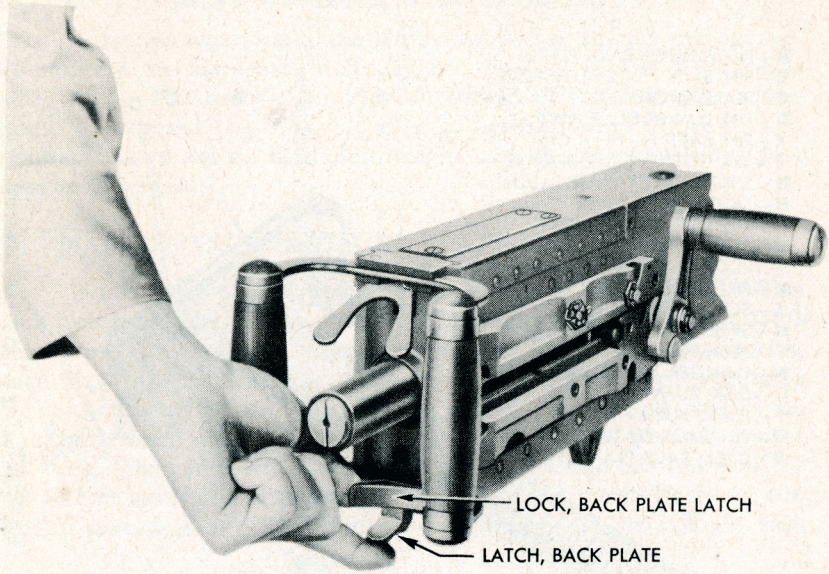


Figure 47 — Removing Back Plate Group

go all the way down. Tighten the adjusting screw as much as possible, using the combination wrench or any other suitable tool.

46. DISASSEMBLY OF BACK PLATE GROUP (figs. 20 and 48).

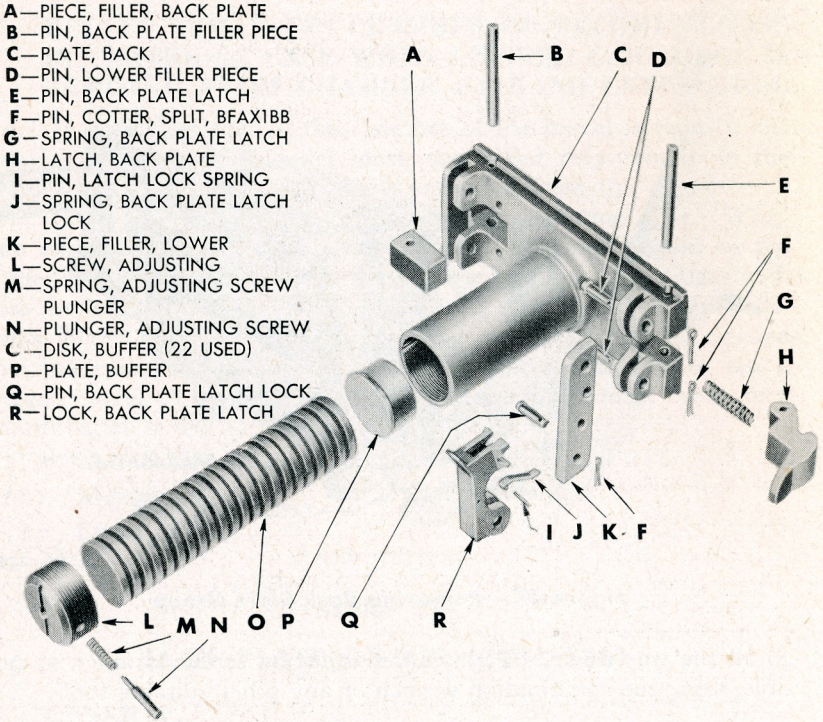
a. Before removing the back plate from the receiver, loosen the adjusting screw, using combination wrench (fig. 31) or other suitable tool. Remove back plate and remove adjusting screw, taking care not to lose the plunger and spring. The buffer disks and buffer plate can then be pushed out to the rear.

b. With a small drift, force out the back plate latch pin, and remove the back plate latch, taking care not to lose the spring. Remove the latch lock by taking out the cotter pin and removing the latch lock pin.

c. If the back plate is equipped with a manual trigger, remove the trigger and trigger spacer by driving out the trigger pin. Do not lose the trigger spring when the pin is removed. If it is necessary to remove the trigger safety assembly, it can be taken off by removing the two staked screws.

47. ASSEMBLY OF BACK PLATE GROUP (figs. 20 and 48).

a. Assemble the back plate latch to the back plate by inserting the back plate latch spring in the latch recess, with the other end in



RA PD 73867

Figure 48 — Back Plate With Horizontal Buffer Group — Exploded View

the recess in the lower filler piece. The latch is pressed forward and the pin is inserted.

b. Insert the buffer plate in the tube of the back plate, putting it in from the back with the small diameter forward and projecting from the front of the back plate. Insert the buffer disks, making sure they are seated properly, and start the adjusting screw. Insert the plunger and spring, depress them so the plunger may enter the tube, and tighten the adjusting screw as much as possible, using the combination wrench or other suitable tool.

c. If the back plate is equipped with a manual trigger, insert the trigger in its recess with the trigger spacer to the left. Seat the spring in the holes in the back plate and trigger, aline the pinholes, and insert the pin. Replace the trigger safety assembly by inserting the two screws, drawing them tight, and then staking the screws.

48. ADJUSTMENT OF BACK PLATE GROUP.

a. When screwed tight, the adjusting screw should project approximately one-sixteenth inch beyond the end of the back plate buffer tube. Not more than one full thread of the adjusting screw should be exposed (fig. 42). It may be necessary to remove or add a buffer disk to secure tight adjustment and at the same time meet these requirements.

49. MAINTENANCE OF BACK PLATE GROUP.

a. If the latch lock spring is weak, it should be replaced. The latch lock spring can be removed by straightening one end of the latch lock spring pin and then removing the pin. To install a new spring, place the spring in its recess with the eye in the end of the spring in line with the pinholes. The bowed side of the spring should be against the latch when the spring is positioned in the pivoted end of the latch. Then insert the latch lock spring through the holes in the side of the latch and the eye of the spring, and carefully bend the equally spaced ends of the spring smoothly toward the straight side of the latch.

b. See that the back plate slides into the receiver properly, guides are not burred or broken, and latch and latch lock function properly. Burs or rough surfaces should be smoothed with crocus cloth or a fine grained sharpening stone.

c. All pins must be properly secured and the trigger safety screws staked in place. Remove any burs from the trigger.

d. Replace any buffer disks showing signs of disintegration.

Section XVI

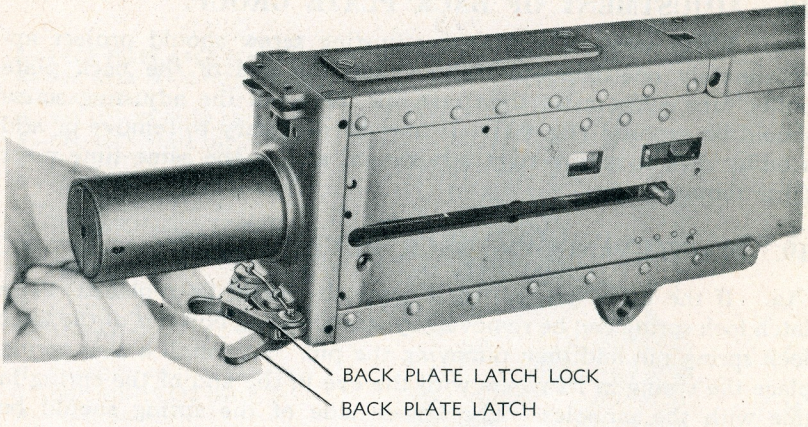
BACK PLATE GROUP (GUN T25E3)

50. GENERAL.

a. The back plate group is attached to the receiver assembly at the rear end of the gun. Its purpose is to stop the recoil of the bolt, as well as to absorb some of the recoil energy.

51. FUNCTIONING.

a. The back plate, besides enclosing the back end of the receiver, houses the parts which cushion the shock caused by stopping the bolt at the end of its recoil stroke and acts as a stop for the barrel buffer group. The back plate slides downward into grooves inside the receiver side plates and surrounds the outside of the side plates at the



RA PD 95343

Figure 49 — Removing Back Plate Group

rear end to prevent spreading of the plates. The back plate is held in position by a latch and latch lock.

b. Assembled into the projecting cylindrical portion of the back plate are the buffer plate and 18 buffer washer springs (Belleville type). These are held firmly in place by the adjusting screw. The final rearward movement of the bolt is stopped as the bolt strikes this buffer plate, and the reaction of these springs assists in starting the bolt forward. A groove in the back plate also supports the driving spring rod assembly to counteract the force of the driving springs.

c. The buffer springs in the tube are slightly compressed during assembly. This insures that practically none of the bolt recoil energy is dissipated, but rather that it is returned to the bolt to speed up the counterrecoil stroke.

52. REMOVAL OF BACK PLATE GROUP.

a. Release the back plate latch lock, pull up on the back plate latch, and slide the back plate up out of the receiver (fig. 49).

53. INSTALLING OF BACK PLATE GROUP.

a. Start the back plate in its slots in the rear end of the receiver side plates, lift latch lock and latch, and push the back plate assembly all the way down, making sure the back plate latch and latch lock are engaged.

54. DISASSEMBLY OF BACK PLATE GROUP (fig. 50).

a. Before removing the back plate from the receiver, loosen the adjusting screw by pressing and holding the adjusting screw plunger

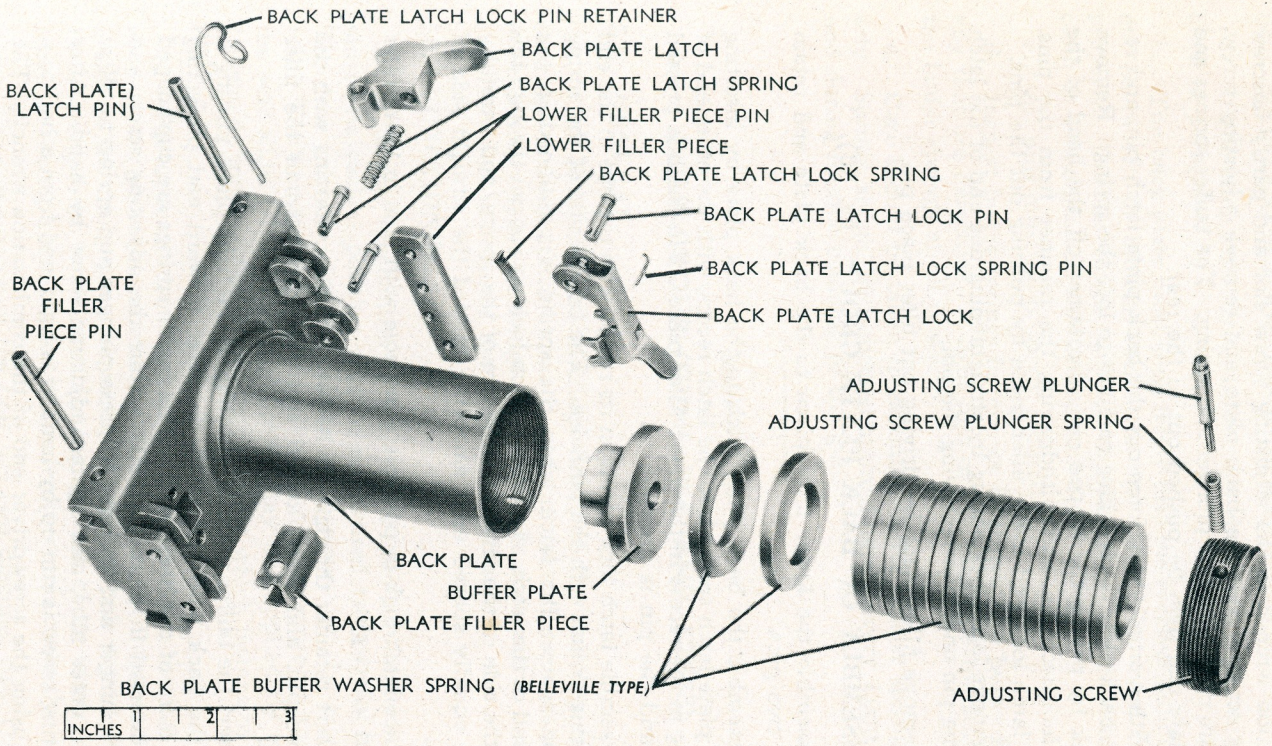


Figure 50 — Back Plate Group — Exploded View

into its recess using a small drift. Insert the screwdriver end of the combination wrench in the adjusting screw slot and partly unscrew adjusting screw. Remove back plate and remove adjusting screw, taking care not to lose the plunger and spring. The buffer springs and buffer plate can then be pushed out to the rear.

b. With a small drift, force out the back plate latch pin, and remove the back plate latch taking care not to lose the spring. Remove latch lock by prying the looped end of retainer off the head of the lower filler piece pin and withdrawing the retainer from the pins. Remove latch lock and lower filler piece by pushing out the pins.

c. Remove latch lock spring by straightening one end of the latch lock spring pin and then removing the pin.

d. Remove filler piece by driving out filler piece pin.

55. ASSEMBLY OF BACK PLATE GROUP (fig. 50).

a. Assemble the lower filler piece to the back plate and retain with the two pins.

b. Assemble the back plate latch to the back plate by inserting the back plate latch spring into the latch recess, with the other end of the spring in the recess in the lower filler piece. The latch is pressed forward and the pin is inserted.

c. Assemble latch lock spring in its recess with the eye in the end of the spring in line with the pinholes. The bowed side of the spring should be against the latch when the spring is positioned in the pivoted end of the latch. Insert the latch lock spring pin through the holes in the side of the latch and the eye of the spring, and carefully bend the equally spaced ends smoothly toward the straight side of the latch.

d. Place latch lock in position, aline hole with hole in lower filler piece, and insert pin.

e. Insert retainer through the holes in the pins, starting with the filler piece pin, and force looped end over the head of the filler piece pin.

f. Insert the buffer plate in the tube of the back plate, putting it in from the back with the small diameter forward and projecting from the front of the back plate. The buffer springs are cup-shaped and are inserted in pairs (fig. 50). Start the adjusting screw and insert the plunger and spring. Depress plunger and spring to allow plunger to enter tube, and tighten adjusting screw by hand. After the adjusting screw is run up by hand, it is tightened from a half to a full turn, using the screwdriver end of the combination wrench. The plunger snaps into a slot in the tube locking the screw in place. Subsequent tightening after firing is unnecessary.

BOLT GROUP (GUNS T36 AND T25E3)

56. MAINTENANCE OF BACK PLATE GROUP.

a. If the latch lock spring is weak, it should be replaced as outlined in paragraph 55 **c.**

b. The back plate must slide freely into the receiver, guides must not be burred or broken, and latch and latch lock must function properly. Burs or rough surfaces should be smoothed with crocus cloth or a fine grained sharpening stone.

c. All pins must be properly secured.

d. Inspect buffer springs for cracks, fractures, and burs. Replace any that are defective. A light film of oil should be maintained on the buffer springs at all times.

e. Care should be taken to assemble buffer washer springs properly. Springs should be inspected approximately every 1,000 rounds and during routine cleaning of the gun.

Section XVII

BOLT GROUP (GUNS T36 AND T25E3)

57. GENERAL.

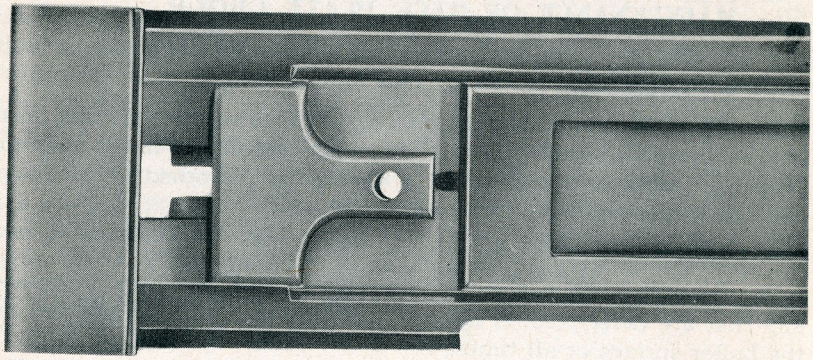
a. The bolt holds the cartridge firmly in the chamber when the cartridge is fired; it withdraws the empty cartridge case and ejects it; it extracts a live cartridge from the belt and inserts it into the chamber; and it actuates the belt feed mechanism.

58. FUNCTIONING.

a. The sear mechanism in the rear of the bolt holds the firing pin in its cocked position until it is released to fire the cartridge. The sear may be actuated either by pressure of the trigger bar (Gun T36) on the top of the sear or by side pressure on the end of the sear slide. The necessary power may be supplied by electrical (solenoid) means or by a cable attachment which fastens to the side plate.

b. The upper end of the cocking lever projects through the top of the bolt (near the rear end of the bolt), and the lower end engages a slot in the firing pin extension. When the bolt moves rearward, the cocking lever is actuated by engagement of its upper end with a cam in the top plate bracket of the receiver; this cocks the firing pin.

c. The top surface of the bolt has two diagonal cam grooves or ways which actuate the belt feed mechanism. The bolt switch fits into a circular depression on the top of the bolt and may be assembled



RA PD 95352

Figure 51 — Rear End of Bolt — Bottom View

so that one or the other of these two ways will be used continuously, depending on whether ammunition is to be fed from the right or left.

d. The extractor assembly at the left side of the bolt withdraws the cartridge from the belt and guides it into the T-slot at the front end of the bolt. The ejector is attached to the front end of the extractor and serves primarily to guide the cartridges into the chamber. It also helps to position the cartridges in the feedway when ammunition is being fed, and pushes the last empty case out of the T-slot.

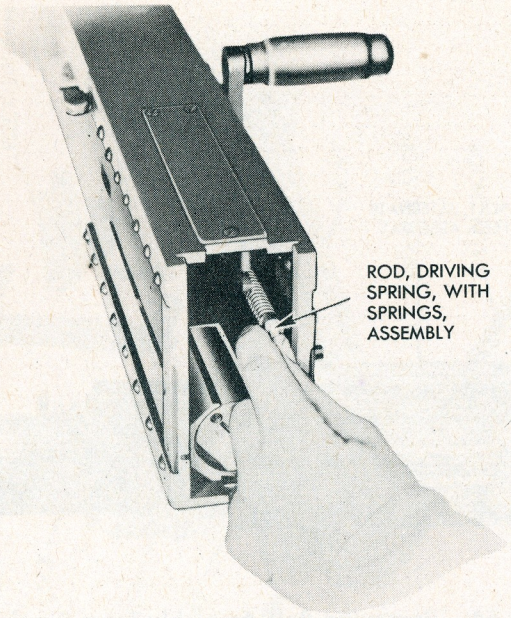
e. A driving spring rod with springs assembly fits into a longitudinal hole in the bolt, and the springs are compressed by the rearward motion of the bolt. After the bolt has been stopped by the back plate, the driving springs drive the bolt forward.

f. A cocking lever stop assembly assembled into the cocking lever slot in the top of the bolt (Gun T25E3) serves as a cushion for the cocking lever as it pivots forward during recoil.

g. The sear (early Guns T36) is secured in the bolt by the accelerator stop which in turn is secured by the accelerator stop lock, the flat end of which is rotated into a slot in the bolt and over the sear when assembled. The block on the bottom of the accelerator stop is positioned in the transverse notch in the bottom of the bolt near its rear end which prevents the accelerator claws from entering the notch.

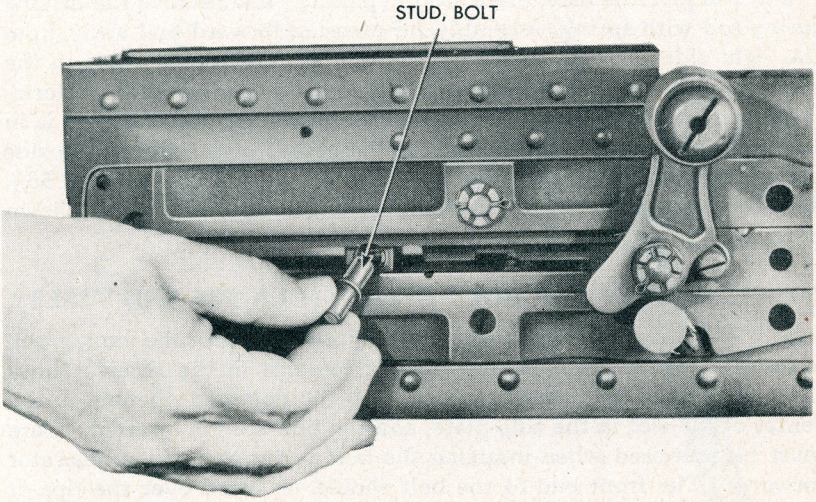
h. The sear (Guns T25E3 and late T36) is secured in the bolt by the sear stop assembly. The bottom of the bolt is designed (fig. 51) to prevent the accelerator claws from entering the transverse notch.

BOLT GROUP (GUNS T36 AND T25E3)



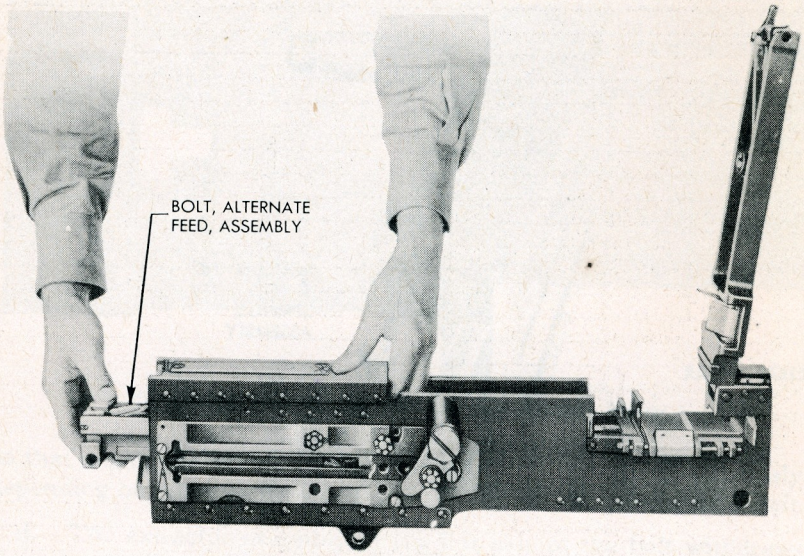
RA PD 73874

Figure 52 — Removing Driving Spring Rod With Springs Assembly



RA PD 73875

Figure 53 — Removing Bolt Stud



RA PD 73876

Figure 54 — Removing Bolt Assembly From Receiver

59. REMOVAL OF BOLT GROUP (GUN T36 AND T25E3).

a. Remove the back plate group (par. 52) and remove the driving spring rod with springs assembly by pressing forward and away from the right side plate to remove the retaining pin from its hole in the receiver plate (fig. 52). Take care not to bend the rod while performing this operation. Draw the bolt to the rear until the bolt stud is in line with enlarged assembly hole in the center of the slot in the side plate. Remove the bolt stud by pulling it out sideways (fig. 53). The bolt may then be removed by sliding it to the rear, as shown in figure 54.

60. INSTALLING OF BOLT GROUP (GUN T36 AND T25E3).

a. With the cocking lever *rotated fully forward,* the bolt group is inserted in the receiver and pushed forward in the receiver until the hole for the bolt stud is in line with the enlarged opening in the center of the slot in the side plate, and the bolt stud is inserted. Care must be exercised when inserting the bolt not to trip the accelerator forward. The front end of the bolt should be lifted over the tips of the accelerator for easy assembly. Insert the driving spring rod with springs assembly into its hole in the bolt and push the bolt completely forward. Push the driving spring rod assembly forward and

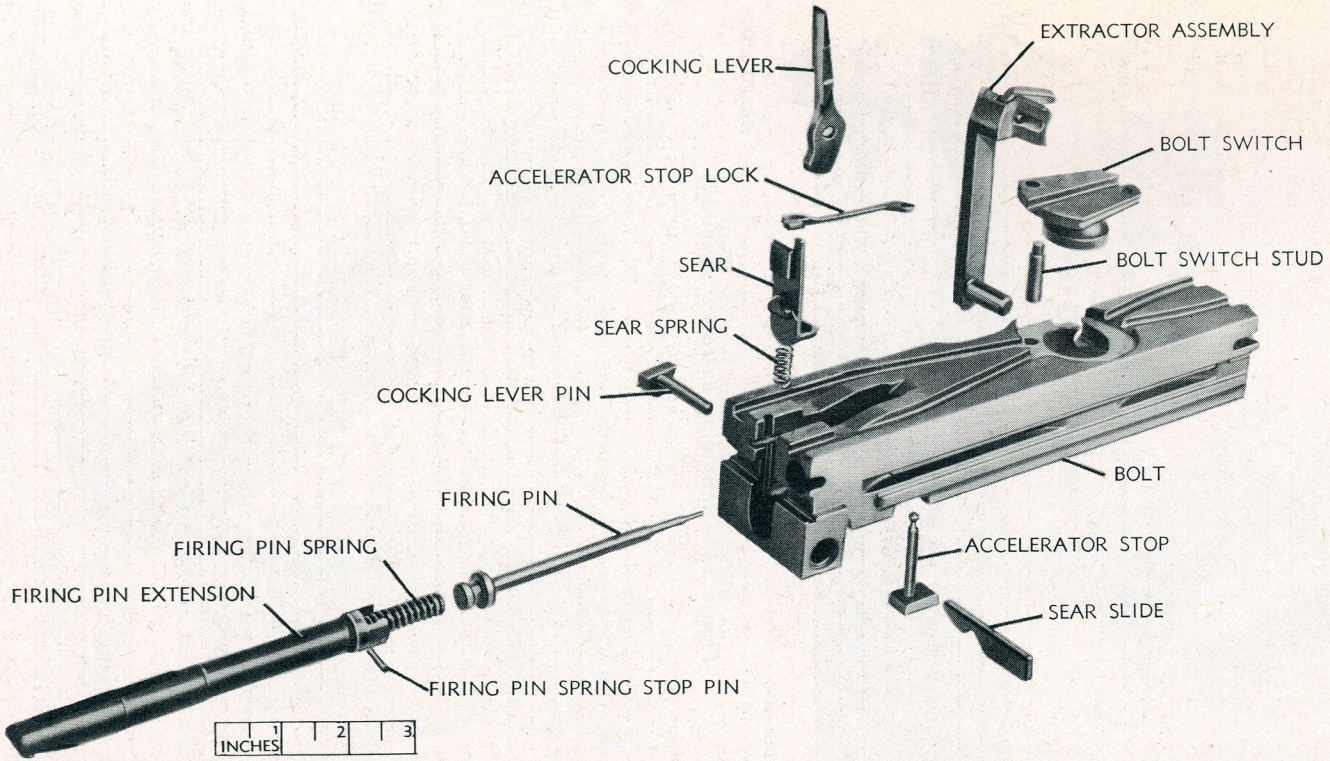
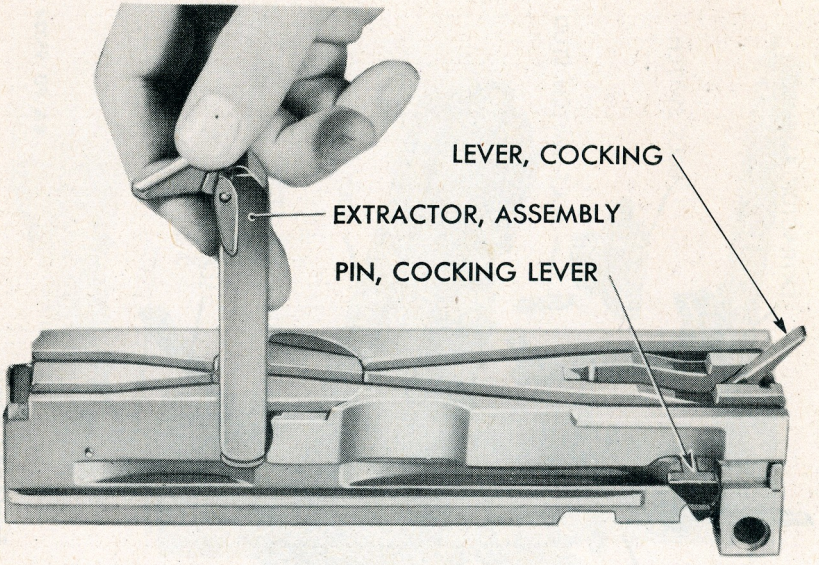
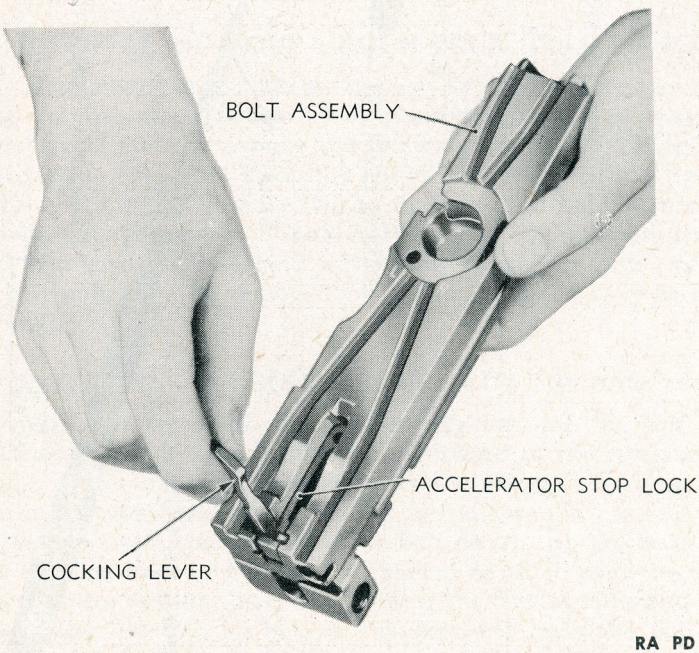


Figure 55 — Early T36 Bolt Group — Exploded View



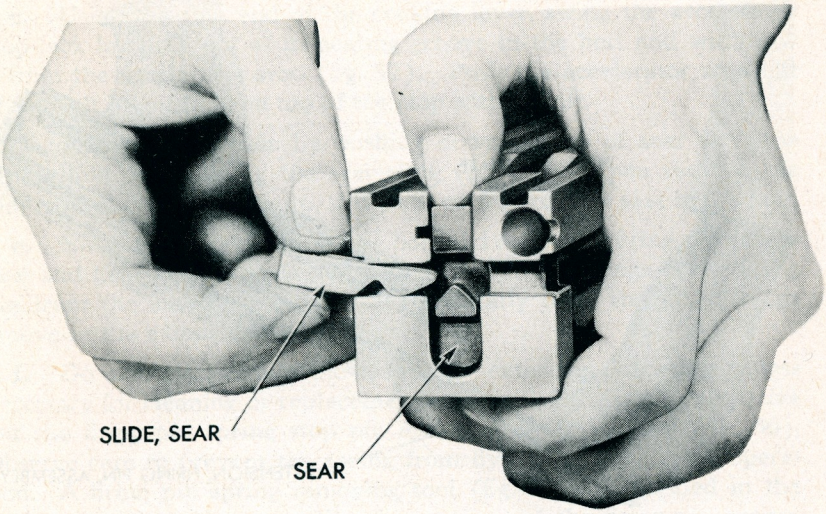
RA PD 50989

Figure 56 — Removing Extractor Assembly



RA PD 95353

Figure 57 — Removing Accelerator Stop Lock



RA PD 50993

Figure 58 — Removing Sear Slide

engage the driving spring rod retaining pin in its opening in the right side plate.

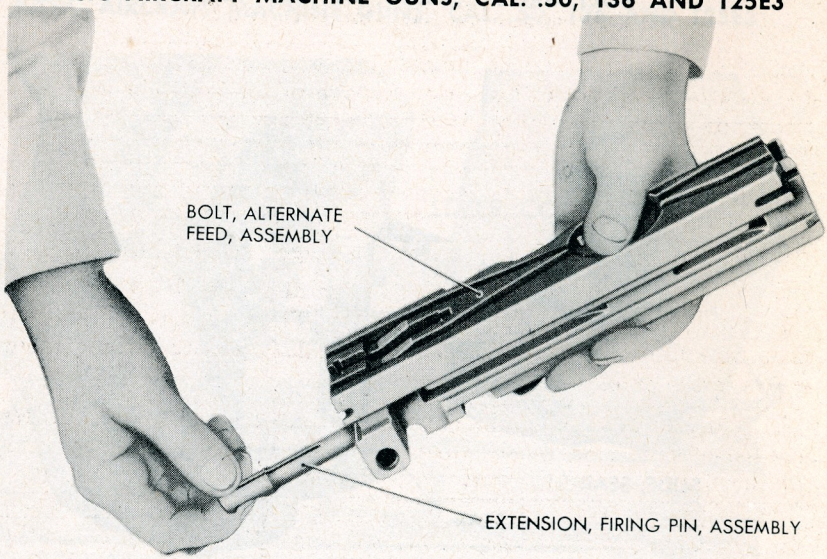
CAUTION: *Do not use the driving spring rod with springs assembly as a lever or guide for the bolt when inserting the bolt in the receiver as this will bend the rod. Be sure that the rod is straight and the outer driving spring does not rub excessively or bind in the bolt hole.*

b. Replace back plate group (par. 53).

61. DISASSEMBLY OF BOLT GROUP (GUN T36) (fig. 55).

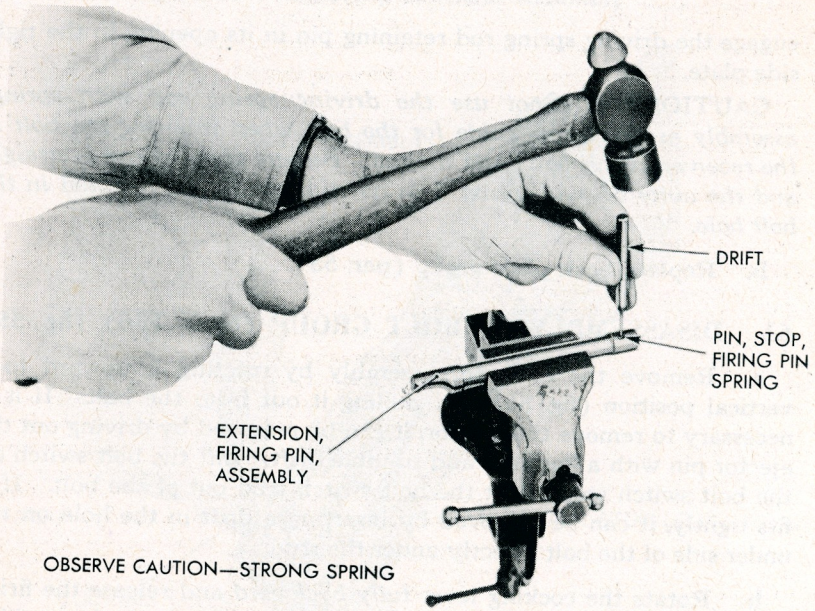
a. Remove the extractor assembly by rotating it upward to a vertical position (fig. 56) and pulling it out from the bolt. If it is necessary to remove the ejector, it can be removed by driving out the ejector pin with a hammer and suitable drift. Lift the bolt switch off the bolt switch stud. Lift the bolt switch stud out of the bolt. If it fits tightly, it can be removed by inserting a drift in the hole on the under side of the bolt directly under the stud.

b. Rotate the cocking lever *fully backward* and release the firing pin by pushing down on the sear protrusion. Push out the cocking lever pin from right to left and pull the cocking lever up out of the bolt.



RA PD 50994

Figure 59 — Removing Firing Pin Extension Assembly



RA PD 50995

Figure 60 — Disassembling Firing Pin Extension

c. Using the thin end of the cocking lever, swing the accelerator stop lock laterally out of its seating groove in the bolt and withdraw it from the accelerator stop (fig. 57). Push the accelerator stop out of the bolt by pushing on top of the stop with a drift.

d. Remove sear slide by pushing down on top of sear with the thumb and withdrawing the sear slide (fig. 58). Then remove the sear from the top of the bolt. Lift sear spring from its seat in the bolt.

e. Elevate the front end of the bolt and allow the firing pin extension and firing pin to slide out (fig. 59). Then disengage the firing pin from the extension by sliding it laterally from the engagement groove in the extension.

f. Do not disassemble the firing pin extension assembly unless necessary for cleaning or replacement of parts. To disassemble, drive out the firing pin spring stop pin and remove the spring (fig. 60). Observe care to prevent the spring from flying out during the operation. A firing pin spring removing tool (fig. 29) is provided in the armorer's tool chest to simplify the removal of the firing pin spring.

g. The driving spring rod and springs should not be disassembled except for cleaning or repair. To disassemble, drive out the stop pin from the collar on the front end of the rod with a punch, allowing the punch to hold the collar in position. Then, holding collar against pressure of the expanding driving springs, withdraw punch and ease collar and springs from the rod. Observe care that collar does not spring off rod when punch is removed as it may cause injury to personnel.

62. ASSEMBLY OF BOLT GROUP (GUN T36).

a. If the firing pin spring has been removed from the firing pin extension, replace the spring and, after compressing it, secure it in place by inserting the firing pin spring stop pin. (Use vise, as shown in figure 60, or firing pin spring removing tool.) Engage the firing pin and firing pin extension, and insert them in the tunnel of the bolt with the notch at the rear of the firing pin extension down. Push the extension all the way forward so that the tip of the firing pin protrudes from the face of the bolt.

b. Seat the sear spring in its seat in the rear of the bolt and insert the sear in the vertical grooves in the rear of the bolt, with the wedge-shaped lug facing outward and pointing upward. Press the sear down upon the sear spring, making sure that the spring is seated level both in its seat in the bolt and in the sear. Insert the sear slide into its lateral guideway in the rear end of the bolt, with the pointed end leading and the notch down. Then depress the sear and push the slide over the lug on the sear until the notch in the slide engages with the

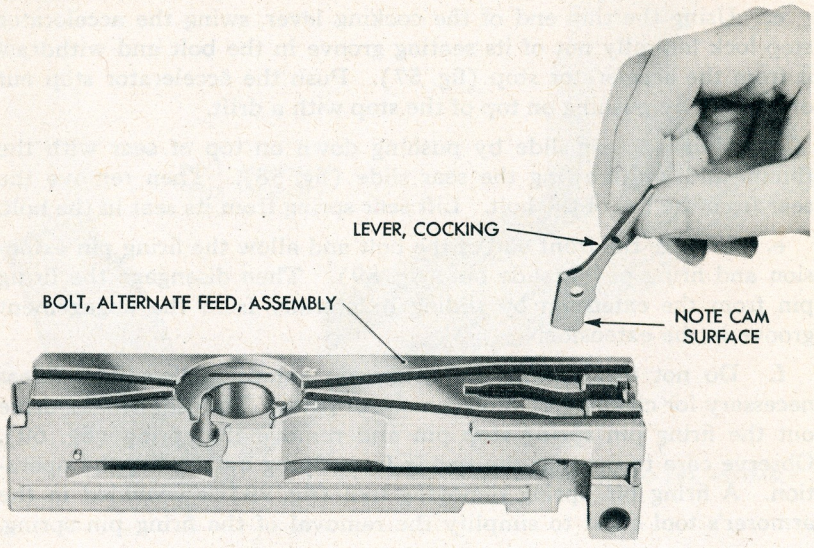


Figure 61 — Inserting Cocking Lever in Bolt

sear lug and holds it in position. If the gun is to be fired by the trigger bar, the square end of the sear slide may be either to the right or to the left. If the gun is to be fired by a mechanism attached to the side plate, the square end of the slide must be on the side from which the weapon is to be fired.

c. Insert the pin on the accelerator stop in its recess in the transverse notch in the bottom of the bolt near the rear end and push the stop into the bolt until the block on the stop is seated in the notch. The pin on the stop passes through the slot in the firing pin extension. Insert the accelerator stop lock in the slot on top of the bolt and engage the fork end in the groove on top of the accelerator stop. Then swing the lock into its groove in the left side of the slot.

d. Insert the cocking lever (fig. 61) in the slot of the bolt, with rounded nose on the lower end of the cocking lever, to the rear and insert the cocking lever pin *from the left side.*

e. Push the cocking lever all the way forward, *return it to its rear position,* and press down on top of the sear. A sharp metallic sound obtained when the firing pin is released will indicate that the firing pin spring and other components are in good working order. *Again push the cocking lever all the way forward for proper preparation of the bolt before assembly in the gun.*

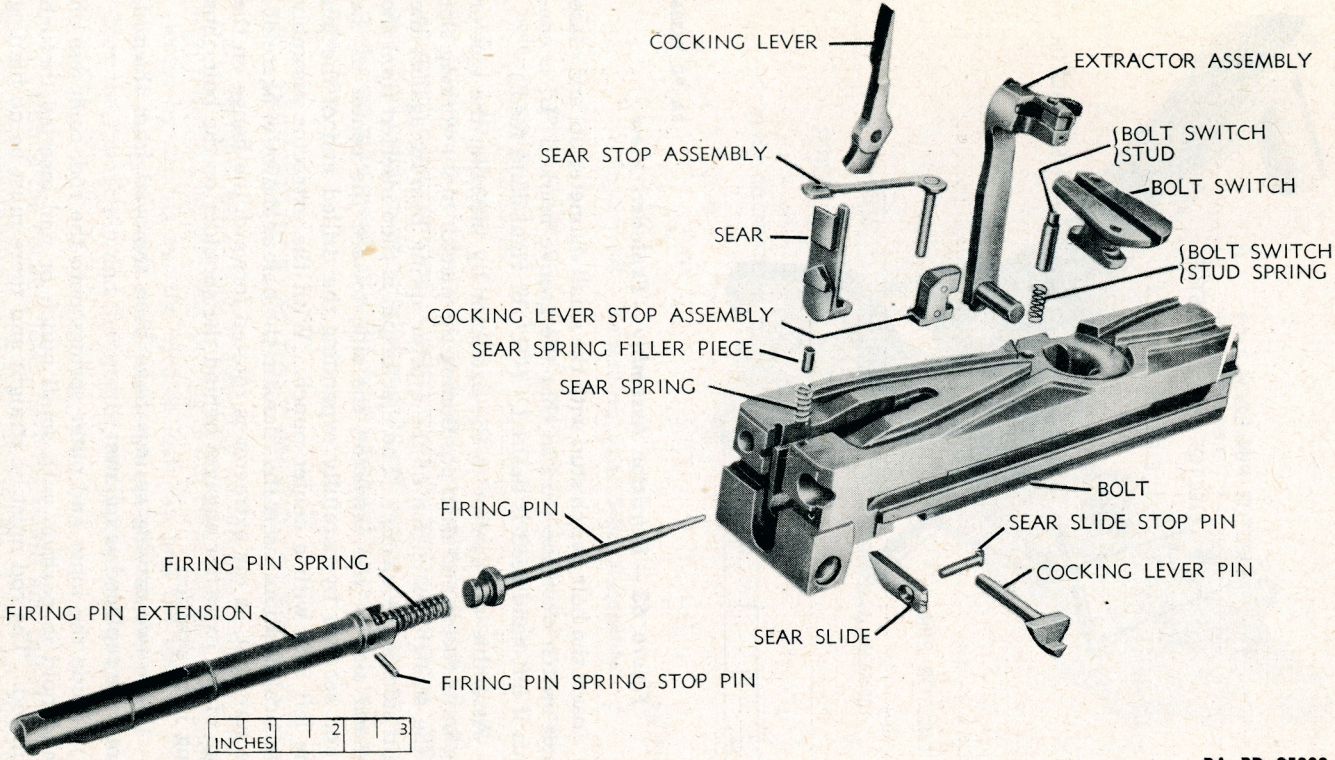
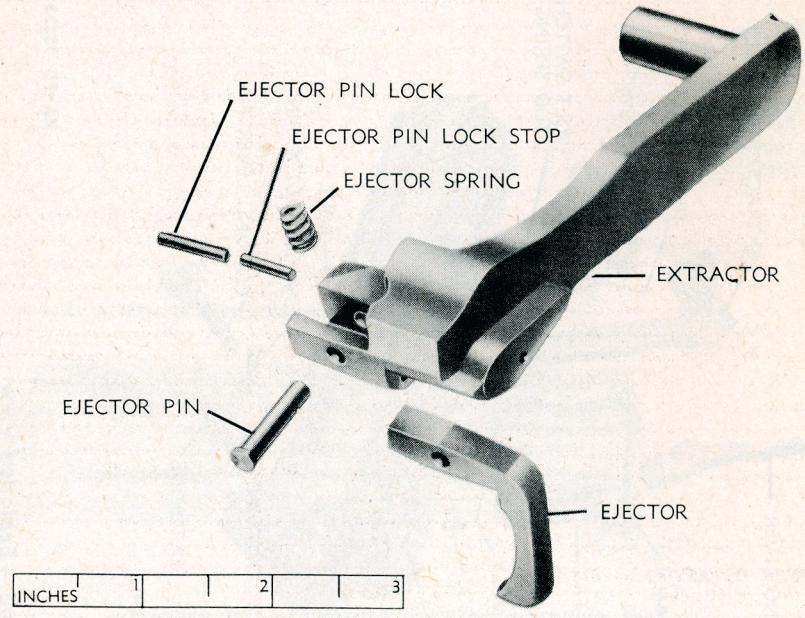


Figure 62 — T25E3 Bolt Group — Exploded View



RA PD 95336

Figure 63 — Extractor Assembly — Exploded View

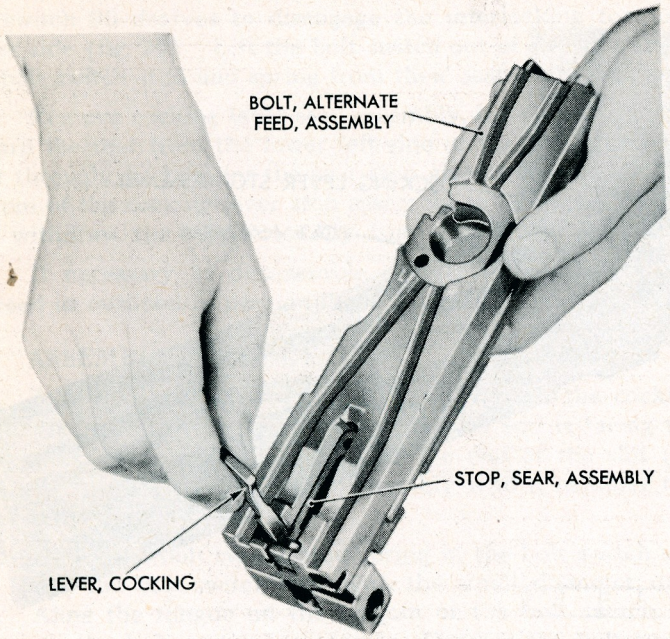
f. Insert the bolt switch stud with the small diameter up, and place the bolt switch over the stud so that the groove marked "L" is continuous if left-hand feed is desired. ("R" for right-hand feed.)

g. Assemble the ejector to the extractor by inserting the ejector spring in its recess and then positioning the ejector in its working slot with the straight extension of the ejector spring bearing against the straight side of the ejector. The ejector pin is then inserted *from the right-hand side of the extractor,* the side toward the center of the gun, and secured by carefully expanding the drilled end of the pin on the left side with a center punch. With the extractor assembly in a vertical position, insert the shank in the bolt as shown in figure 56. Make sure that, as the extractor is rotated forward, the flange on the bottom of the extractor engages behind the shoulder on the bolt, thus locking it in position.

h. If the two driving springs have been removed from the rod, they may be replaced as follows:

(1) Slide the inner and outer springs onto the rod, compress on rod, and hold in position with small punch or nail inserted through hole in rod. The rod must be straight and there must be no binding between inner and outer spring, or between inner spring and rod.

BOLT GROUP (GUNS T36 AND T25E3)



RA PD 50991

Figure 64 — Removing Sear Stop Assembly

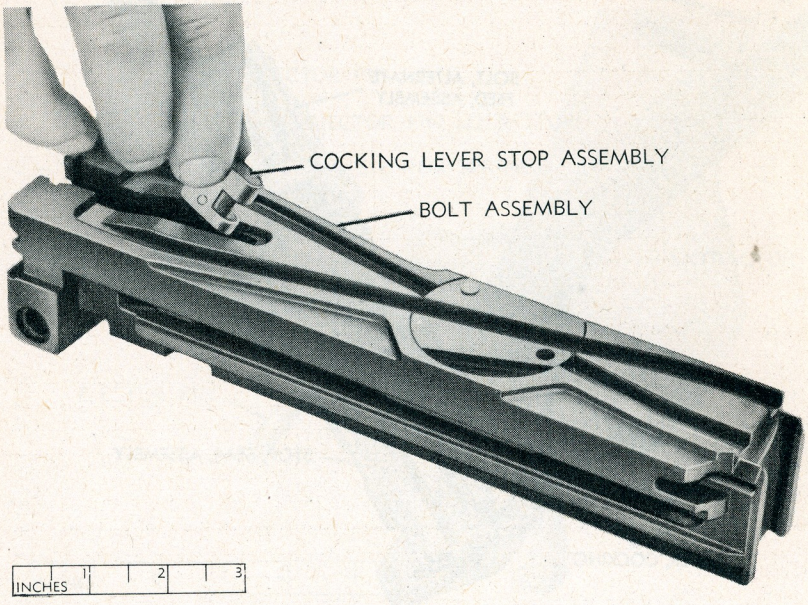
(2) Slide collar on rod and, holding firmly, withdraw punch, aline holes in collar and rod, and replace punch temporarily.

(3) Insert stop pin so that head will be on same side of rod as the retaining pin in the rod head, and drive through until flush, pushing punch out in process. Upset end of pin to hold in place. Observe care that collar does not slip and fly off during process, as injury to personnel may result. (If old pin is damaged by removal, replace with new one.)

63. DISASSEMBLY OF BOLT GROUP (GUN T25E) (fig. 62).

a. Remove the extractor assembly by rotating it upward to a vertical position (fig. 56) and pulling it out from the bolt. Remove the ejector by driving out the ejector lock pin and the ejector lock pin stop by using a small drift inserted from the teardrop side. Withdraw the ejector pin and the ejector, taking care not to lose the spring (fig. 63).

b. Rotate the cocking lever *fully backward* and release the firing pin by pushing down on the sear protrusion. Push out the cocking lever pin and lift the cocking lever out of the bolt.



RA PD 95340

Figure 65 — Inserting Cocking Lever Stop Assembly in Bolt

c. Withdraw the sear slide stop pin from its recess in the bolt and remove the sear slide.

d. Using the thin end of the cocking lever, swing the sear stop assembly laterally out of its seating groove in the bolt and withdraw it from the bolt (fig. 64).

e. Remove sear by pulling it up and out of the bolt. Remove sear spring and sear spring filler piece.

f. Elevate the front end of the bolt and allow the firing pin extension and firing pin to slide out (fig. 59). Then disengage the firing pin from the extension by sliding it laterally from the engagement groove in the extension.

g. Do not disassemble firing pin extension assembly unless necessary for cleaning or replacement of parts. To disassemble, drive out the firing pin spring stop pin and remove the spring (fig. 60). Observe care to prevent the spring from flying out during the operation. A firing pin spring removing tool (fig. 29) is provided in the armorer's tool chest to simplify the removal of the firing pin spring.

h. Remove the bolt switch by depressing the spring-loaded bolt switch stud with a drift and, using the cocking lever as a tool, rotate

the switch 90 degrees to disengage the interlocking tongue on the under side (fig. 26). Lift the bolt switch out of the bolt and remove the bolt switch stud and spring from their seat in the bolt.

i. Remove cocking lever stop assembly, if necessary, by prying it toward the rear from the lower left side of the bolt. Insert a small drift through the hole for the sear stop assembly and *lightly* tap the bottom of the cocking lever stop assembly to remove it from its seat and withdraw the stop assembly from the top of the bolt.

j. If necessary to disassemble driving spring rod and springs, proceed as outlined in paragraph 61 **g**.

64. ASSEMBLY OF BOLT GROUP (GUN T25E3).

a. Insert the cocking lever stop assembly into the cocking lever slot in the top of the bolt so that the curved end is facing the front of the bolt, and push forward against the end of the slot (fig. 65). If necessary *lightly* tap the stop assembly with a hammer to seat it in place.

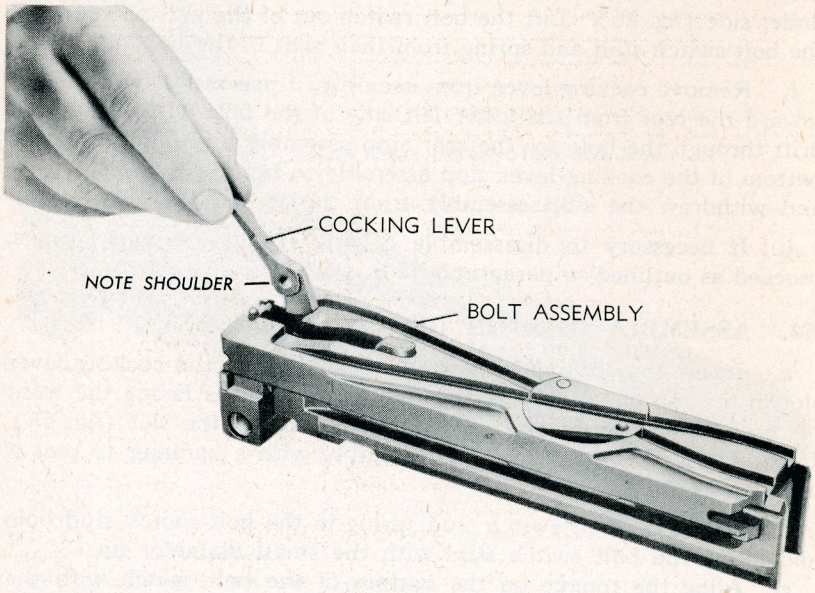
b. Insert the bolt switch stud spring in the bolt switch stud hole and insert the bolt switch stud with the small diameter up.

c. Aline the tongue on the bottom of the bolt switch with the groove in the bolt and insert switch. Depress the bolt switch stud and, using the cocking lever as a tool (fig. 26), rotate the switch so that the groove marked "L" is continuous if left-hand feed is desired. ("R" for right-hand.) Make sure bolt switch is retained in position by the engagement of the bolt switch stud.

d. If the firing pin spring has been removed from the firing pin extension, replace the spring and, after compressing it, secure it in place by inserting the firing pin spring stop pin. (Use vise, as shown in figure 60, or firing pin spring removing tool.) Engage the firing pin and firing pin extension, and insert them in the tunnel of the bolt with the notch at the rear of the firing pin extension down. Push the extension all the way forward so that the tip of the firing pin protrudes from the face of the bolt.

e. Insert the sear spring filler piece inside the coiled sear spring and seat this assembly in its seat in the rear of the bolt. Insert the sear in the vertical grooves in the rear of the bolt with the wedge-shaped lug facing outward and pointing upward. Press the sear down upon the sear spring, making sure that the spring is seated level both in its seat in the bolt and in the sear.

f. Insert the sear slide into its lateral guideway in the rear end of the bolt with the pointed end leading so that the cam abuts the cam on the sear. Then, depress the sear slightly and push the slide toward the sear lug until the elongated slot in the slide alines with the sear slide stop pin hole in the bolt. Retain the sear slide in position



RA PD 95342

Figure 66 — Inserting Cocking Lever in Bolt

by inserting the sear slide stop pin through its hole in the bolt and the slot in the slide. The stop pin should be inserted so that its head faces toward the front of the bolt.

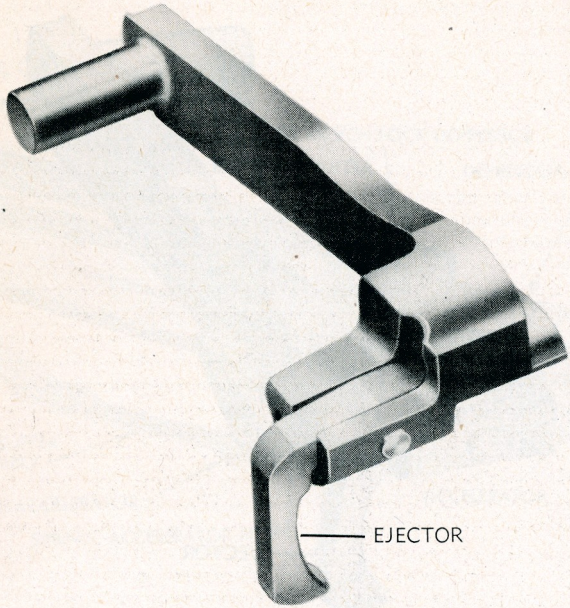
NOTE: *The square end of the slide must be on the side from which the weapon is to be fired.*

g. Insert the sear stop assembly in the slot on top of the bolt. Using the wedge-shaped end of the cocking lever as a tool, swing the stop into its groove in the left side of the slot.

h. Insert the cocking lever (fig. 66) in the slot on top of the bolt with the rounded nose on the lower end of the lever to the rear and the shoulder on the side of the lever to the right, and insert the cocking lever pin. The head of the cocking lever pin retains the sear slide stop pin in position; therefore, the cocking lever pin must be inserted from the side to which the sear slide is assembled.

i. Push the cocking lever all the way forward, *return it to its rear position,* and press down on top of the sear. A sharp metallic sound obtained when the firing pin is released will indicate that the firing pin spring and other components are in good working order. *Again push the cocking lever all the way forward for proper preparation of the bolt before assembly in the gun.*

BOLT GROUP (GUNS T36 AND T25E3)

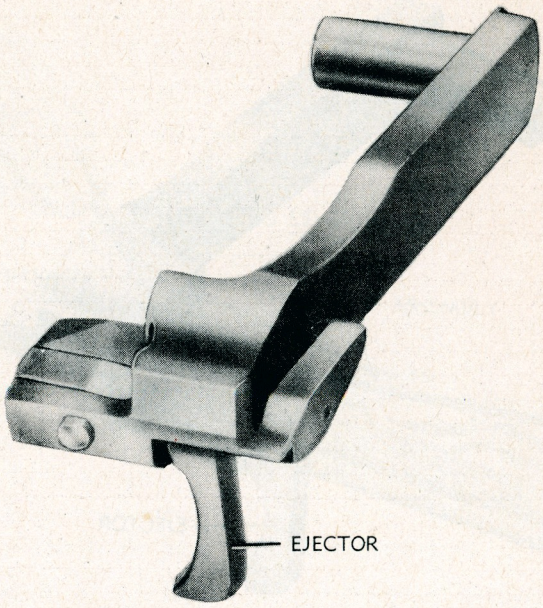


RA PD 95337

Figure 67 — Extractor Assembly With Ejector Claw Assembled on the Right Side

j. Assemble the ejector to the extractor by inserting the ejector spring into its recess and then positioning the ejector in its working slot. If the gun is to be assembled for left-hand feed, the ejector should be assembled to the right side of the extractor (fig. 67) and, if assembled for right-hand feed, the ejector should be assembled to the left side of the extractor (fig. 68). The ejector spring should always be assembled so that it is on the opposite side of the ejector pin from the ejector claw. Aline the hole in the ejector with the hole in the extractor and insert the ejector pin in from the front. The flat surface on the head of the pin must be toward the top. Insert the ejector lock pin stop (solid pin) followed by the ejector lock pin (hollow pin) from the right side of the extractor (the side opposite the teardrop). With the extractor assembly in a vertical position, insert the shank in the bolt as shown in figure 56. Make sure that, as the extractor assembly is rotated forward, the flange on the bottom of the extractor engages behind the shoulder on the bolt, thus locking it in position.

k. If driving spring rod and springs have been disassembled, assemble as outlined in paragraph 62 **h.**



RA PD 95335

Figure 68 — Extractor Assembly With Ejector Claw Assembled on the Left Side

65. MAINTENANCE OF BOLT GROUP (GUNS T36 AND T25E3).

a. The firing pin spring must always be removed when cleaning rust-preventive compound to insure complete removal of all compound from the coils of the spring and from its recess in the firing pin extension. The free length of the firing pin spring must be between $3\frac{5}{32}$ and $3\frac{7}{32}$ inches.

b. Remove any rust or burs from the bolt, using crocus cloth or a fine sharpening stone. Clean all recesses of foreign matter, grease, or excess oil, paying particular attention to the tunnels for the firing pin and driving spring rod groups.

Section XVIII

OIL BUFFER GROUP (GUN T36)

66. GENERAL.

a. The oil buffer group is composed of two main assemblies: the oil buffer body assembly, and the oil buffer assembly with spring and

OIL BUFFER GROUP (GUN T36)

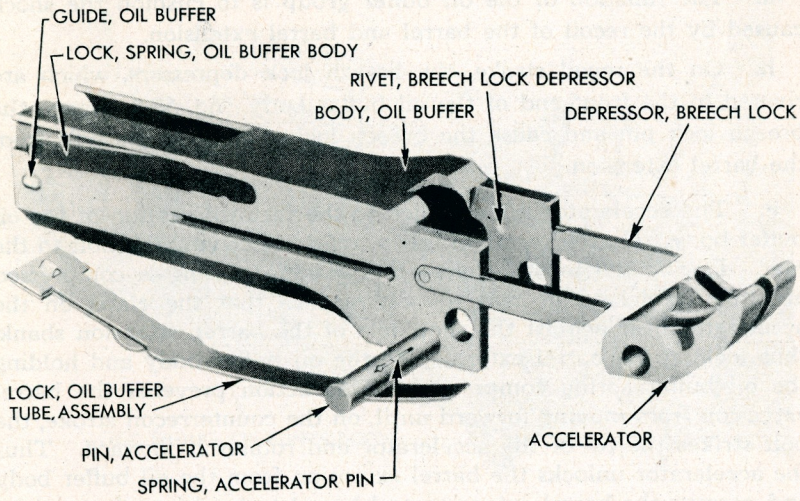


Figure 69 — Oil Buffer Body Group — Exploded View

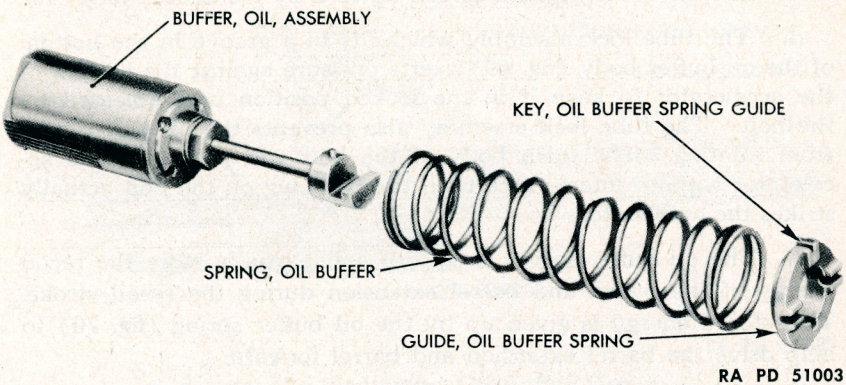


Figure 70 — Oil Buffer Assembly With Spring and Guide — Exploded View

guide. The body is roughly rectangular, bored cylindrically, houses the oil buffer assembly with spring and guide, and is locked in the rear lower end of the receiver when assembled by a leaf spring staked in the body. Projecting from the front of the body are two breach lock depressors. Just below these depressors, the accelerator is pivoted laterally on a spring positioned pin extending through the body and the accelerator.

67. FUNCTIONING.

a. The function of the oil buffer group is to cushion the shock caused by the recoil of the barrel and barrel extension.

b. On the recoil stroke, the breech lock depressors, which are riveted to the front end of the oil buffer body (fig. 69), engage the breech lock pin and cause the breech lock to unlock the bolt from the barrel extension.

c. The accelerator is assembled to the forward portion of the oil buffer body. On the recoil stroke, it assists in driving the bolt to the rear. During the recoil stroke, the oil buffer spring is compressed and the accelerator is rotated rearward so that the claws on the accelerator bear against the shoulders of the barrel extension shank, thus locking the barrel extension to the oil buffer body and holding the oil buffer spring compressed. This action prevents the barrel extension from moving forward until, on the counterrecoil stroke, the bolt strikes the tip of the accelerator and rotates it forward. Thus the accelerator unlocks the barrel extension from the oil buffer body and permits the barrel extension and barrel to be driven forward by the compressed oil buffer spring. The accelerator also times the forward movement of the barrel, barrel extension, and bolt so that the locking recess in the bottom of the bolt is directly over the breech lock when the breech lock is forced upward by the breech lock cam.

d. The tube lock assembly which fits in a groove in the bottom of the oil buffer body (fig. 69) exerts pressure against the bottom of the accelerator to keep it in the locked position until released by the bolt. The tube lock assembly also prevents the oil buffer tube from rotating. The main body of the bolt will pass over the accelerator without interference until the back lug on the bolt actually strikes the accelerator.

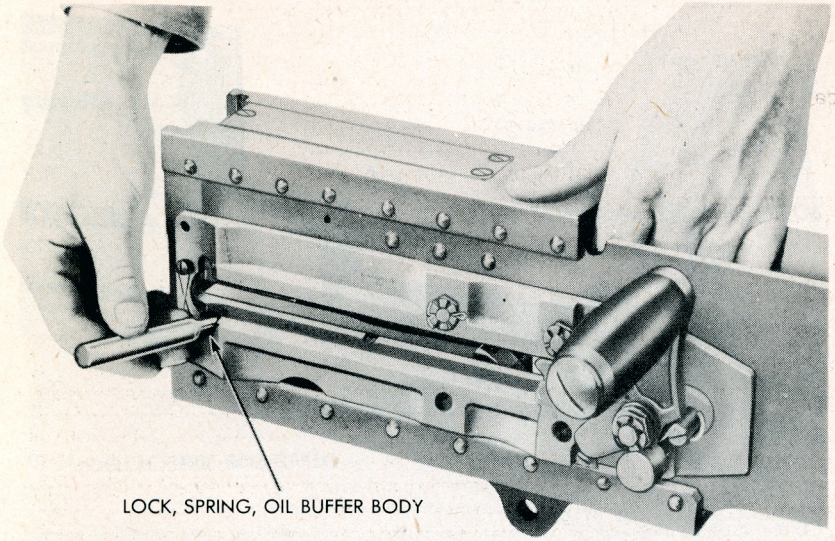
e. The oil buffer serves to absorb and partially store the recoil energy of the barrel and barrel extension during the recoil stroke. This stored energy is given up by the oil buffer spring (fig. 70) to help drive the barrel extension and barrel forward.

68. REMOVAL OF OIL BUFFER GROUP.

a. Remove back plate group and bolt group (pars. 44 and 59).

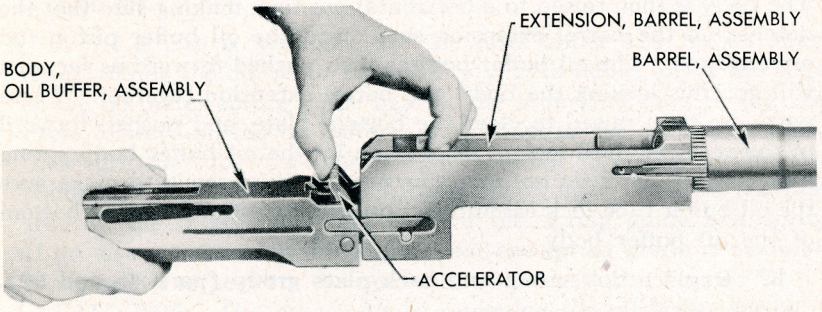
b. Insert a drift or the bullet end of a cal. .50 cartridge in the hole near the rear of the right side plate (fig. 71), and depress the oil buffer body spring lock. At the same time, push the barrel, barrel extension, and oil buffer group to the rear. The oil buffer group is disconnected from the barrel extension by pushing forward on the tips of the accelerator, as shown in figure 72.

OIL BUFFER GROUP (GUN T36)



RA PD 73877

Figure 71 — Releasing Oil Buffer Body Spring Lock



RA PD 73878

Figure 72 — Removing Oil Buffer Group

69. INSTALLING OF OIL BUFFER GROUP.

a. Insert the barrel and barrel extension into the receiver until the lower projection on the barrel extension contacts the bottom plate. Make sure that the oil buffer assembly is pushed all the way forward in the oil buffer body. The oil buffer body is held in the right hand, with the index finger holding up the accelerator. Holding the oil buffer body at an angle, as shown in figure 73, the breech lock depressors are started into the guideways of the barrel extension.

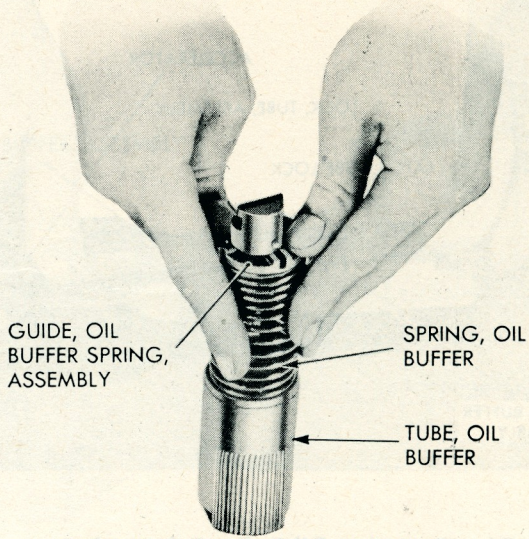


Figure 75 — Removing Oil Buffer Spring

tighten, using combination wrench. Then screw piston rod head on rod, with the shoulder away from the cap, until the end of the threaded shoulder is flush with the end of the rod. The distance from the forward face of the piston rod head to the forward face of the shank engaging notch on the end of the piston rod should not be less than 3.970 + 0.014 inches. Place valve assembly on the shoulder of the rod head with the flat face toward the rod head. Screw the piston head nut on the rod head allowing a clearance of approximately 0.050 inch between the rod head and valve assembly. Aline the slots in the nut and shoulder of the rod head with the hole in the rod, insert the piston head nut pin, and bend both ends of the pin.

b. Insert the rod and its assembled parts into the oil buffer tube with the valve keys riding in the grooves in the tube wall. Tighten the tube cap securely with the combination wrench.

c. Place the oil buffer spring over the piston rod, seat it on the tube cap, and place the flat surface of the spring guide on top of the spring with the guide key in line with the pin on the notched side of the piston rod. Following the procedure outlined in paragraph 70 **d**, compress the oil buffer spring until the ends of the pin in the piston rod pass through the slots in the guide. Then give the piston

rod one-quarter turn and allow the pin to seat in its recesses in the guide. Make sure that the spring key is in line with, and to the right of, the notch in the piston rod when viewed from the rear with the notch up.

d. Position the tube lock assembly over the slot in the bottom of the oil buffer body with the bowed side away from the buffer body. With the flanges of the lock body over the enlarged cut in the slot, depress the lock body into the cut and slide forward, raising the projecting rear end of the lock body slightly so that the lug on the body clears the oil buffer body. The lug should engage in the hole in the bottom of the oil buffer body and the tube lock assembly should be pushed forward until the tube lock latch can be depressed into the circular opening in the tube lock slot.

e. Place the accelerator, with the tips up and rounded surfaces to the front, between the depressors on the oil buffer body and insert the accelerator pin, taking care that both ends of the pin are flush with the sides of the oil buffer body.

f. Insert the oil buffer assembly in the body with the guide key in the slot in the side of the body, and push all the way forward.

72. ADJUSTMENT OF OIL BUFFER GROUP.

a. The distance from the forward face of the piston rod head to the forward face of the shank engaging notch on the end of the piston rod should not be less than 3.970 + 0.014 inches.

b. There should be a clearance of approximately 0.050 inch between the oil buffer piston rod head and the oil buffer piston valve assembly. If necessary, adjust the oil buffer piston head nut to obtain this clearance.

c. In order for the oil buffer spring to function properly in the gun during the complete recoil stroke, the assembled length of the oil buffer assembly must be within the proper dimensions. The distance from the rear of the oil buffer tube to the extreme forward face of the oil buffer piston rod (over-all length) must be within 6.525 and 6.553 inches (fig. 43).

73. MAINTENANCE OF OIL BUFFER GROUP.

a. Remove any burs on guide lug on side of body and the key slot.

b. Check breech lock depressors for loose rivets, deformation, or burs.

c. Remove any burs from accelerator and accelerator pin. Inspect for chipping and wear.

d. Remove any burs or rust from the oil buffer tube. Inspect for dents or deformation.

e. Check piston for deformation, wear, burs, or rust. Remove all burs or rust. Inspect buffer spring for cracks or rust, and key on guide for looseness, wear, and burs.

f. To prevent rusting of the interior of the oil buffers, resulting in possible binding of the oil buffer piston rod assembly:

(1) Periodically, apply a small quantity of preservative lubricating oil (special) into the buffer. Under high temperature and humidity use preservative lubricating oil (medium) for lubrication of the oil buffer.

(2) Rotate the oil buffer assembly to enable the oil to cover all interior surfaces.

(3) Invert it to permit any excess oil to run out.

NOTE: *The oil may be introduced and drained through the relief valve hole in the cap, or through the bottom of the tube after removing one filler screw and replacing it after excess oil has been drained off.*

Section XIX

BARREL BUFFER GROUP (GUN T25E3)

74. GENERAL.

a. The barrel buffer group is composed of two main assemblies: the barrel buffer body assembly, and the barrel buffer assembly with spring and guide. The body is roughly rectangular, bored cylindrically, houses the barrel buffer assembly with spring and guide, and is locked in the rear lower end of the receiver when assembled by a leaf spring staked in the body. An accelerator is attached to the front of the body by a pin.

b. The barrel buffer assembly is, in general, composed of a hollow cylindrical body, open at one end, which is closed by a threaded cap. A piston rod assembled through a hole in the cap is attached to a piston in the tube by a pin. A relief valve, spring, and retainer are assembled to the end of the piston. Enclosed in the piston are 10 cup-shaped buffer springs. A coil spring is assembled on the piston rod, outside the tube, bears on the tube cap, and is held in position under compression by a guide. This guide is in the form of a washer, held in place by a cross pin passing through and extending from the forward end of the piston rod, bearing in notches in the guide when assembled.

BARREL BUFFER GROUP (GUN T25E3)

75. FUNCTIONING.

a. This group has two main functions:

(1) To cushion the shock caused by the recoil of the barrel and barrel extension.

(2) To transmit the recoil energy through the accelerator to speed up the recoil of the bolt.

b. On the recoil stroke, the breech lock depressors which are riveted to the side plates and nest snugly into grooves in the buffer body engage the breech lock pin and cause the breech lock to unlock the bolt from the barrel extension.

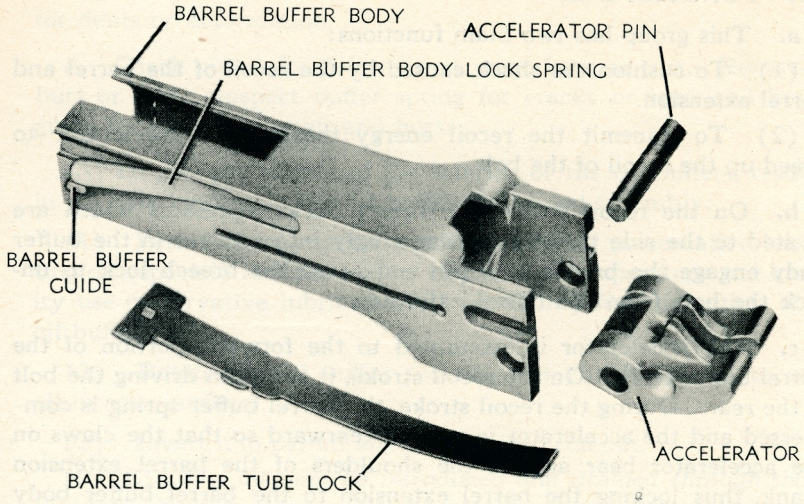
c. The accelerator is assembled to the forward portion of the barrel buffer body. On the recoil stroke, it assists in driving the bolt to the rear. During the recoil stroke, the barrel buffer spring is compressed and the accelerator is rotated rearward so that the claws on the accelerator bear against the shoulders of the barrel extension shank, thus locking the barrel extension to the barrel buffer body and holding the barrel buffer spring compressed. This action prevents the barrel extension from moving forward until, on the counter-recoil stroke, the bolt strikes the tips of the accelerator and rotates it forward. Thus the accelerator unlocks the barrel extension from the barrel buffer body and permits the barrel extension and barrel to be driven forward by the compressed barrel buffer spring. The accelerator also times the forward movement of the barrel, barrel extension, and bolt so that the locking recess in the bottom of the bolt is directly over the breech lock when the breech lock is forced upward by the breech lock cam.

d. The tube lock assembly which fits in a groove in the bottom of the barrel buffer body (fig. 76) exerts pressure against the bottom of the accelerator to keep it in the locked position until released by the bolt. The tube lock assembly also prevents the barrel buffer tube from rotating. The main body of the bolt will pass over the accelerator without interference until the back lug on the bolt actually strikes the accelerator.

76. REMOVAL OF BARREL BUFFER GROUP.

a. Remove back plate group and bolt group (pars. 52 and 59).

b. Insert a drift or the bullet end of a cal. .50 cartridge in the hole near the rear of the right side plate (fig. 71) and depress the barrel buffer body spring lock. At the same time, push the barrel, barrel extension, and barrel buffer group to the rear. The barrel buffer group is disconnected from the barrel extension by pushing forward on the tips of the accelerator, as shown in figure 72.



RA PD 95338

Figure 76 — Barrel Buffer Body Group — Exploded View

77. INSTALLING OF BARREL BUFFER GROUP.

a. Insert the barrel and barrel extension into the receiver until the lower projection on the barrel extension contacts the bottom plate. Make sure that the barrel buffer assembly is pushed all the way forward in the barrel buffer body. The barrel buffer body is held in the right hand with the index finger holding up the accelerator. With the rear end of the barrel buffer body slightly depressed, engage the piston rod with the barrel extension shank. Push the barrel buffer body forward as far as it will go, thus rotating the accelerator upward and to the rear to lock the barrel extension to the barrel buffer. Press down on the tips of the accelerator to insure complete locking.

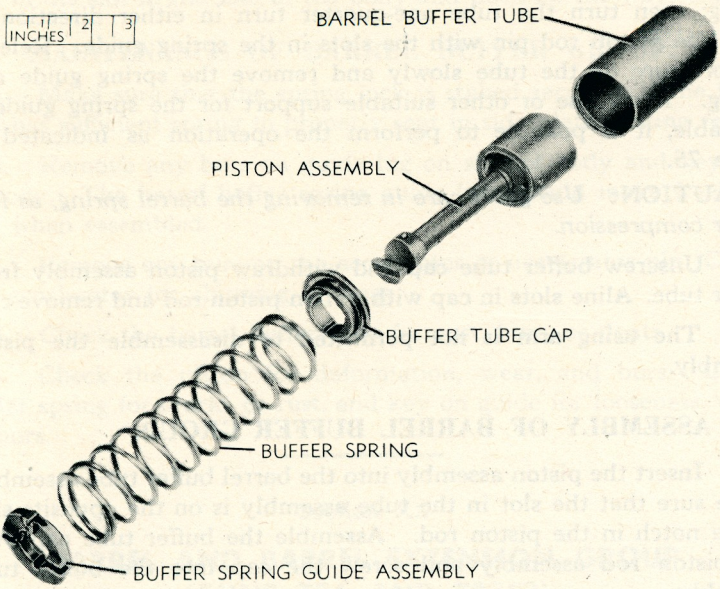
b. With the groups thus locked together, raise the rear end until clear of the bottom plate and push fully forward until locked in position by the barrel buffer spring lock seating in the locking recess in the lower rear corner of the right-hand side plate of the receiver. If these parts do not move forward readily, check to make sure the barrel buffer tube lock assembly is properly positioned in the bottom of the barrel buffer body.

c. Replace bolt group and back plate group (pars. 53 and 60).

78. DISASSEMBLY OF BARREL BUFFER GROUP (fig. 77).

a. Using a screwdriver or other suitable tool, raise the rear end of the tube lock latch out of the locking recess in the tube slot of

BARREL BUFFER GROUP (GUN T25E3)



RA PD 95322

Figure 77 — Barrel Buffer Group — Exploded View

the body and remove the barrel buffer assembly from the barrel buffer body by pressing on the end of the piston rod with the index finger.

b. Turn the body over and place upside down on a bench. Using a screwdriver or other suitable tool, raise the rear end of the tube lock latch out of its locking recess in the body. With the latch thus disengaged, elevate the tips of the accelerator and rotate them slightly rearward, at the same time pressing downward on the forward end of the tube lock, as shown in figure 74. Rotate the accelerator rearward and the tube lock assembly will be pushed out of its recess. The pressure of the left hand will keep it from springing out suddenly.

c. The barrel buffer body spring lock is staked in position and should not be removed unless necessary. To remove, drive out to the rear.

d. Using a drift, push out the accelerator pin and remove the accelerator.

e. If a vise is available, set the jaws about 1⅛ inches apart; then, holding the oil buffer tube firmly in both hands, place the edges of the oil buffer spring guide against the separated jaws of the vise.

Press forward on the barrel buffer tube to depress the barrel buffer spring; then turn the tube one-quarter turn in either direction to aline the piston rod pin with the slots in the spring guide. Release the pressure on the tube slowly and remove the spring guide and spring. If no vise or other suitable support for the spring guide is available, it is possible to perform the operation as indicated in figure 75.

CAUTION: *Use great care in removing the barrel spring, as it is under compression.*

f. Unscrew buffer tube cap and withdraw piston assembly from buffer tube. Aline slots in cap with pin on piston rod and remove cap.

g. The using arm is not permitted to disassemble the piston assembly.

79. ASSEMBLY OF BARREL BUFFER GROUP.

a. Insert the piston assembly into the barrel buffer tube assembly. Make sure that the slot in the tube assembly is on the opposite side of the notch in the piston rod. Assemble the buffer tube cap over the piston rod assembly and screw the cap into the buffer tube assembly.

b. Place the barrel buffer spring over the piston rod, seat it on the tube cap, and place the flat surface of the spring guide on top of the spring with the guide key in line with the pin on the notched side of the piston rod. Following the procedure outlined in paragraph 78 **e**, compress the buffer spring until the ends of the pin in the piston rod pass through the slots in the guide. Then give the piston rod one-quarter turn and allow the pin to seat in its recesses in the guide. Make sure the spring key is in line with, and to the right of, the notch in the piston rod when viewed from the rear with the notch up.

c. Position the tube lock assembly over the slot in the bottom of the barrel buffer body with the bowed side away from the buffer body. With the flanges of the lock body over the enlarged cut in the slot, depress the lock body into the cut and slide forward, raising the projecting rear end of the lock body slightly so that the lug on the body clears the barrel buffer body. The lug should engage in the hole in the bottom of the barrel buffer body and the tube lock assembly should be pushed forward until the tube lock latch can be depressed into the circular opening in the tube lock slot.

d. Place the accelerator with the tips up and rounded surfaces to the front in position in the front of the barrel buffer body and insert the accelerator pin, taking care that both ends of the pin are flush with the sides of the body.

e. Insert the barrel buffer assembly in the body with the guide key in the slot in the side of the body and push all the way forward.

80. MAINTENANCE OF BARREL BUFFER GROUP.

a. Make sure that the spring lock is staked securely in the body and has sufficient spring to properly seat in side plate locking recess.

b. Remove any burs on guide lug on side of body and key slot in body. The barrel buffer spring guide key should move freely in slot when assembled.

c. Remove any burs on the accelerator or accelerator pin. Check the accelerator for chipping or wear.

d. Check the barrel buffer tube for rust, burs, or dents.

e. Check the piston for deformation, wear, and burs. Check buffer spring for cracks or rust, and key on guide for looseness, wear, or burs.

Section XX

BARREL AND BARREL EXTENSION GROUP (GUNS T36 AND T25E3)

81. GENERAL.

a. The barrel is cylindrical, threaded at the rear end to screw into the barrel extension loosely enough for easy adjustment. Just forward of this thread, serrations are cut around the periphery for engagement of the barrel locking spring which holds the barrel in adjustment with regard to headspace when assembled to the barrel extension.

b. The barrel extension extends to the rear of the barrel when screwed to it. Its front end is a formed lug into which the barrel is screwed. Integral side members extend rearward, terminating in lugs pointing downward and carrying the breech lock. At the rear end is the barrel extension shank pinned in position and extending to the rear to engage with the oil buffer piston rod when assembled.

c. The breech lock slides vertically in grooves in the rear end of the barrel extension, and is retained by a pin passing laterally through breech lock and elongated holes in the side members of the barrel extension.

82. FUNCTIONING.

a. The function of the barrel is to house the cartridge and direct the projectile when fired. The barrel is rifled to rotate the projectile which helps to maintain direction and prevent tumbling.

b. The bolt is supported by the side walls of the barrel extension and slides in grooves cut for it. These side walls act as tension members to hold the bolt locked against chamber pressure due to explosion.

c. The function of the breech lock is to lock the bolt to the barrel extension. When pushed upward, it engages in a recess in the bottom of the bolt. The breech lock is operated by the breech lock cam assembled to the bottom plate of the receiver, and cams formed on the breech lock depressors. The breech lock cam causes upward locking movement of the breech lock during the forward movement of the barrel extension against the bottom of the breech lock. The breech lock depressors cam the breech lock down by bearing on the lock pin, on the rearward movement of the barrel extension.

d. A hook formed on the barrel extension shank engages with a hook formed on the buffer piston rod to hold the two in engagement when assembled. The rear face of this hook on the shank abuts the front face of the piston rod hook. Thus the barrel extension pushes the piston backward in the buffer on the rearward (recoil) movement and is pushed forward by it on the forward (counterrecoil) movement due to expansion of the buffer spring which is compressed on the rearward movement of the piston. The accelerator pivoted to the buffer body engages with shoulders on the barrel extension shank to hold it locked to the rear until released by the bolt on its forward movement.

83. REMOVAL OF BARREL AND BARREL EXTENSION GROUP.

a. Remove back plate group (par. 44).

b. Remove belt group (par. 59).

c. Remove buffer group (par. 68).

d. Remove barrel and barrel extension group by pulling it out through the rear of the receiver.

84. INSTALLING OF BARREL AND BARREL EXTENSION GROUP.

a. Insert the barrel and barrel extension group into the rear end of the receiver until the lower projection on the barrel extension contacts the bottom plate. Assemble buffer group to barrel extension as outlined in paragraph 69. These parts are then raised to clear the bottom plate, and pushed forward in the receiver until locked in position by the buffer body spring lock.

b. Replace bolt group (par. 60).

c. Replace back plate group (par. 45).

BARREL AND BARREL EXTENSION GROUP (GUNS T36 AND T25E3)

85. DISASSEMBLY OF BARREL AND BARREL EXTENSION GROUP.

a. Remove the barrel by unscrewing from the barrel extension.

b. Remove the barrel locking spring by sliding it forward out of its seat. This spring is staked and should not be removed unless replacement of the spring is necessary. It may be driven out by using a pin drift inserted in the small hole near the rear of the spring.

c. Push out the breech lock pin and remove the breech lock.

86. ASSEMBLY OF BARREL AND BARREL EXTENSION GROUP.

a. The breech lock is assembled into the barrel extension with the beveled faces to the front and the slot on top. Insert the pin, making sure that both ends are flush with the sides of the barrel extension.

b. If barrel locking spring has been removed, insert it in its recess with the protrusion inside pushed back as far as it will go, and stake in position.

c. Screw the barrel into the barrel extension.

87. ADJUSTMENT OF BARREL AND BARREL EXTENSION GROUP.

a. Headspace and timing is adjusted when the weapon is fully assembled. Adjustment of headspace and timing is covered in paragraphs 16 and 17.

88. MAINTENANCE OF BARREL AND BARREL EXTENSION GROUP.

a. Barrels having worn or damaged locking notches may permit the barrel to turn during firing, thus allowing headspace to change; therefore, if this condition exists the barrel should be replaced.

b. The barrel must be kept clean of all metal and other fouling.

c. If the barrel extension shank is crooked, loose, or broken, the barrel extension should be replaced.

d. If the barrel locking spring is worn or broken, it should be replaced.

e. Any burs in the bolt guides or the breech lock slot in the barrel extension should be removed, using a fine grained sharpening stone or crocus cloth.

f. Remove all burs from the breech lock, using a fine grained sharpening stone or crocus cloth.

Section XXI

COVER GROUP (GUNS T36 AND T25E3)

89. GENERAL.

a. The cover hinges in the trunnion block, pivoting on the cover pin, close the forward end of the receiver and carry the belt feeding mechanism. The cover is held open when raised by the cover detent pawl housed in the trunnion block. The cover is latched by the cover latch engaging under the top plate when the cover is closed. The cover extractor cam is riveted to the left inner side of the cover, and acts upon the extractor to depress it against the switch upon the recoil movement of the bolt. The cover extractor spring is assembled to the right of the extractor cam. The forward end (cover closed) is secured by a headed stud engaging in a slot in the end of the spring; and the rear end, by an undercut in the extractor cam and the cover latch spring which is in turn retained by a headed stud and the cover latch. The cover extractor spring bears upon the extractor, causing it to spring into the extractor groove in the head of the cartridge and grip it when in the feeding position.

b. A short round stop may be clipped on the under side of the cover over the belt feed slide retainer. The stop, being flexible, follows the change in height of the belt during feeding and assures positive contact of the camming edge of the stop and the forward end of the link until the round is extracted from the belt.

90. FUNCTIONING.

a. The belt feed slide carries the belt feed pawl, arm, and springs, and operates in a guideway running transversely in the forward end of the cover. The belt feed pawl is pivoted on the belt feed pawl pin, and is held down to engage the belt by the inner and outer belt feed pawl springs. The belt feed pawl arm, pinned to the pawl, guards against stoppage by preventing engagement of the pawl with the belt on the feeding stroke in case a cartridge still remains in the feedway.

b. The belt feed lever is pivoted at the middle on a stud in the cover, and operates the slide with a lateral movement. A stud formed on the opposite (rear) end of the lever engages in a cam slot cut in the top of the bolt when the cover is latched. The belt feed lever plunger and spring are housed in a hole in the side of the belt feed lever and keep the lever in the correct position when the cover is open so that, when the cover is closed, the stud on the rear end of the lever will properly engage the cam slot in the bolt. The cam slot in the bolt is so cut that the forward and backward movement of the bolt cause a side-to-side movement of the lever stud engaged in it.

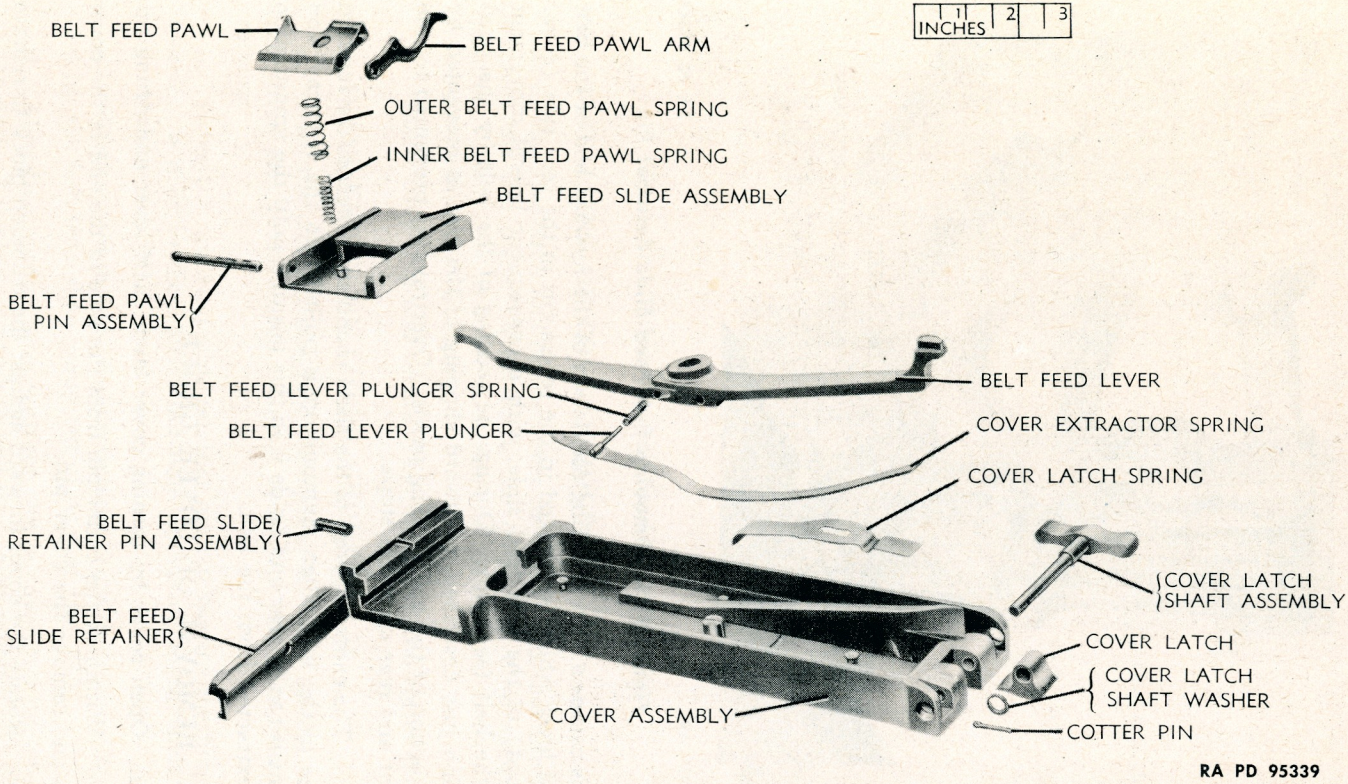
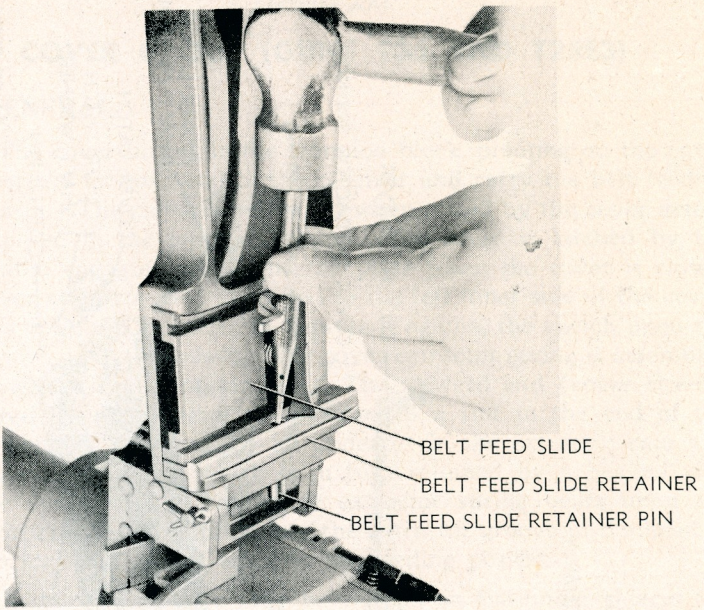


Figure 78 — Cover Group — Exploded View



RA PD 95341

Figure 79 — Removing Belt Feed Slide Retainer Pin

This causes a corresponding oscillation of the forward end of the belt feed lever which is engaged in the recess cut in the rear side (cover closed) of the belt feed slide, with a consequent lateral movement of the belt feed slide. During the feeding of the belt by the pawl action just described, backward slipping of the belt is prevented by the action of the belt holding pawls. Overtravel is prevented by the front and rear cartridge stops.

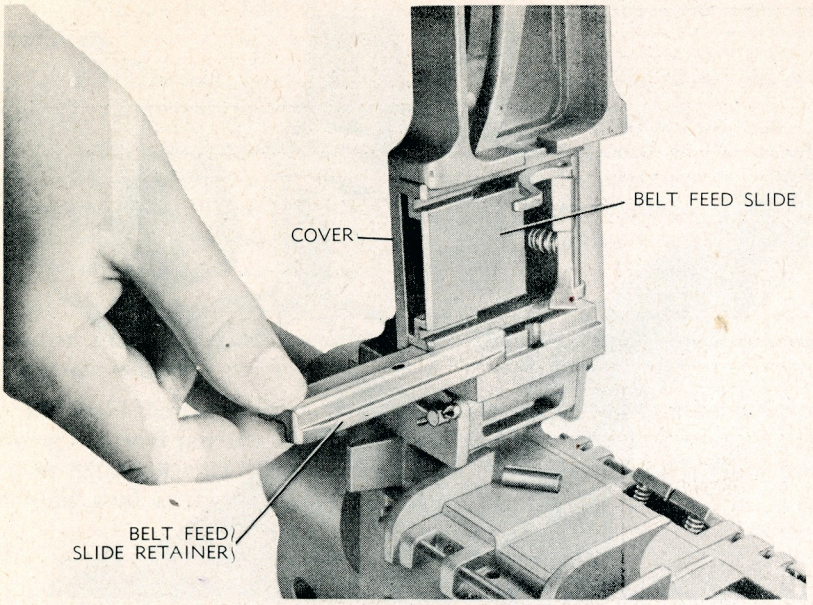
c. The camming edge of the short round stop engages the forward edge of the link when ammunition is pulled into the feedway, and cams it to the rear and holds it in this position until the ammunition is extracted from the belt.

91. REMOVAL OF COVER GROUP.

a. Open cover by turning cover latch shaft lever and lifting up.

b. Withdraw the cotter pin from the hole in the end of the cover pin and remove the cover pin.

c. Rotate the cover forward against the trunnion block to remove it from its seat between the side plates.



RA PD 95346

Figure 80 — Removing Belt Feed Slide Retainer

92. INSTALLING OF COVER GROUP.

a. Place the *latch end* of the cover in position so that the latch engages the top plate. Then force the *hinge* end downward into position. Aline hole in cover with holes in side plates, using a drift to secure alinement if necessary.

b. Insert cover pin and secure it in place with the cotter pin.

93. DISASSEMBLY OF COVER GROUP (fig. 78).

a. With the cover raised, pry the ends of the stop off the top of the cover and remove stop from its seat over the belt feed slide retainer.

b. Drive the belt feed slide retainer pin out toward the hinge by inserting a drift in the half round hole appearing in the belt feed slide retainer (fig. 79).

c. Withdraw the belt feed slide retainer from the cover (fig. 80) and lift the belt feed slide group out of its seat (fig. 81).

d. Aline front end of lever with the slot in cover and lift lever off of the stud. Take care not to lose belt feed lever plunger and spring.

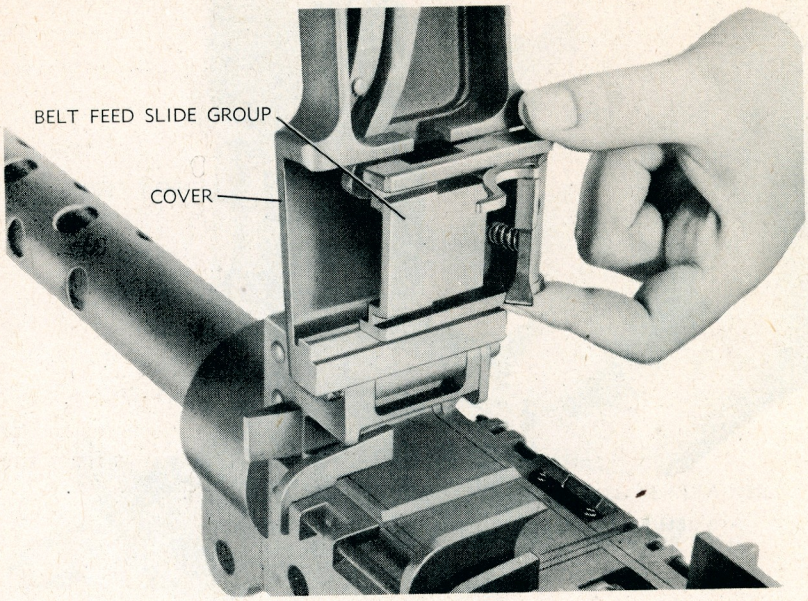


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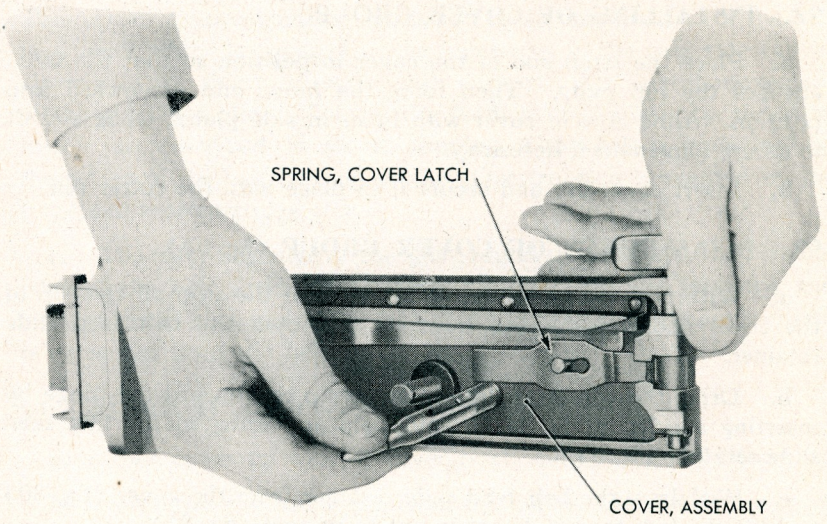
Figure 81 — Removing Belt Feed Slide Group



RA PD 51008

Figure 82 — Removing Cover Latch Spring

e. Remove belt feed lever plunger and spring from the hole in the lever.

f. Push the belt feed pawl pin out of the belt feed slide and remove the belt feed pawl, springs, and belt feed pawl arm.

g. Lift end of cover latch spring out of the groove in the cover (fig. 82) and turn this lifted end slightly so that it rests on the cover extractor spring. The cover latch spring is then compressed by firm pressure of the thumb, and the spring is slid away from the latch and removed.

h. The latch is taken out by removing the shaft cotter pin and washer, *turning the latch shaft to the latch position,* and withdrawing the shaft from the cover.

i. Hold the cover extractor spring with the thumb to keep it from flying out, and pry the rear end of the spring out of its recess in the cover extractor cam. Remove the spring by disengaging it from the holding stud at the opposite end.

94. ASSEMBLY OF COVER GROUP (fig. 78).

a. The latch is assembled to the cover by placing the latch between the pin bosses on the under side of the cover with the keyway toward the top of the cover and with the projecting wing of the latch against the under side of the cover. The shaft can be installed from either side but, if a retracting slide is used, the shaft lever must be on the opposite side from the slide to provide hand clearance. Insert the latch shaft assembly with the key on the shaft toward the cover. Place the washer on the shaft and secure by inserting the cotter pin with the head toward the hinged end of the cover. Bend the ends of the pin closely against the shaft to avoid interference when latching the cover.

b. Install the cover extractor spring by hooking the slotted end under the extractor spring stud, with the curved end away from the cover. Hold the spring firmly against the stud, depress the curved end, and engage it in the recess in the cover extractor cam.

c. Place the cover latch spring inside the cover with the bent end against the cover and the enlarged hole over the extractor spring stud. Making sure that the latch end of the spring rides over the projecting wing of the latch, depress the spring and, at the same time, slide the spring toward the latch. Snap the bent end of the spring into the groove in the cover.

d. Place the belt feed lever spring and plunger in the top hole of the belt feed lever (cover open) for left-hand feed (bottom hole for right-hand feed), as shown in figure 25. Place the hole in the center of the lever over the belt feed lever stud in the cover and posi-

tion the toe of the lever through the slot in the front of the cover. Depress the lever until seated against cover.

c. When the belt feed slide is assembled for either right- or left-hand feed, the belt feed pawl arm must be placed over the belt feed pawl pin so that the arm will be toward the rear when the cover is closed. The pawl and pawl arm, properly assembled, are placed in the belt feed slide with the inner and outer springs held by the spring stud in the slide and recess in the pawl. The springs are depressed to aline the holes and the pin inserted. The belt feed slide is placed in its way or groove in the cover with the pawl end of the slide toward the slide from which the gun is to be fed. Insert the belt feed slide retainer in its ways in the cover, aline hole in retainer with hole in cover, and insert belt feed slide retainer pin from the bottom.

95. MAINTENANCE OF COVER GROUP.

a. Any burs on the cover latch, cover extractor cam, belt feed lever, pivot stud, belt feed slide, belt feed slide retainer, or belt feed pawl should be removed, using crocus cloth or a fine grained sharpening stone.

b. If the cover extractor spring or cover latch spring is weak or broken, it should be replaced.

c. The belt feed lever must have free movement. Any binding due to burs, rust, or broken parts should be corrected.

Section XXII

RECEIVER AND BARREL JACKET GROUP (GUNS T36 AND T25E3)

96. GENERAL.

a. The receiver assembly consists of two side plates, a bottom plate, top plate, trunnion block, trunnion adapter, and other parts assembled permanently to them. The trunnion block forms the basic part of the receiver. The side plates are attached to the trunnion block and extend rearward. The top and bottom plates are attached to the side plates. The barrel jacket is threaded to a trunnion adapter which is attached to a boss extending from the forward end of the trunnion block, and thread qualification, when assembled, is obtained by the use of a shim. The barrel passes through the trunnion block and barrel jacket when assembled, supported at the rear end by engagement in the barrel extension and at the forward end by the recoil booster attached to the front end of the barrel jacket. The barrel extension is supported in the receiver by the breech lock

cam. The breech bearing attached to the rear end of the barrel jacket and screwed into the trunnion block acts as a guide to keep the barrel in alinement with the recoil booster and the barrel extension. A feedway for the ammunition belt is cut in the top of the trunnion block and the front of the side plates. At the bottom of the feedway cut in the side plates, belt holding pawl brackets are riveted to support the belt holding pawl and cartridge stops. A hole bored through the side plates and trunnion block in the lower front corner furnishes a bearing for the front gun trunnion pin when mounting the gun. A hole bored through the top forward end of the side plates and trunnion block houses the cover pin.

97. FUNCTIONING.

a. The rectangular box formed by the side plates houses the working mechanism of the gun. The rear end of this box is closed by the back plate group which slides in grooves in the plates, and the top forward end is closed by the cover group hinged on the cover pin.

b. Assembled to the belt holding pawl brackets are the rear cartridge stop, link stripper, front cartridge stop, right and left belt holding pawls, belt holding pawl sleeve, and springs held in position by the belt holding pawl pins.

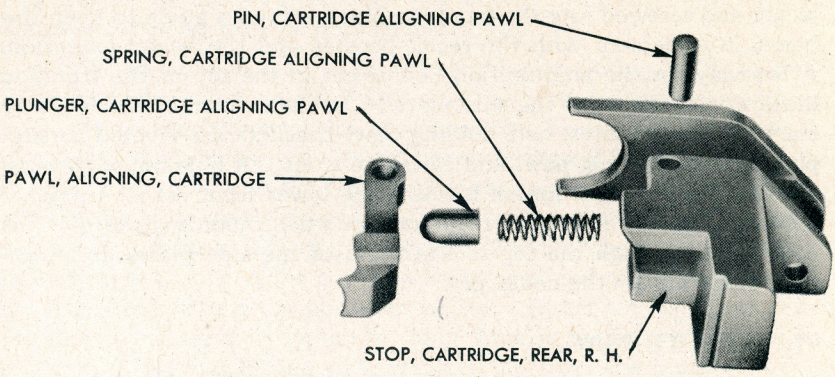
c. The switch regulates the operation of the extractor in feeding when the gun is operated. It is pivoted to the inner face of the left-hand side plate. Just ahead of the switch is riveted the extractor cam which raises the extractor at the end of the forward movement.

d. Breech lock depressors are riveted to the lower rear end of the side plates on the inside (Gun T25E3) (fig. 49). The breech lock depressors engage the breech lock pin and cause the breech lock to unlock the bolt on the recoil stroke.

NOTE: *The breech lock depressors for the Gun T36 are riveted to the oil buffer body.*

e. The bottom plate is fastened to the rear section of the side plates at the bottom. An opening is left between the bottom plate and trunnion block for ejection of empty cartridge cases. The breech lock cam is fastened to the inner forward end of the bottom plate by means of a stud on the cam passing through a hole in the bottom plate and secured by a bolt and nut.

f. The top plate is fastened to the side plates and covers the upper rear end of the receiver. The top plate bracket is fastened to the under side of the plate, and forms a bearing against which the free end of the cocking lever operates. On the Gun T36 it also forms a bearing for the trigger bar pin, upon which the trigger bar is pivoted.



RA PD 51014

Figure 83 — Right-hand Rear Cartridge Stop Assembly — Exploded View

g. The barrel jacket is perforated to permit air to circulate through, onto the barrel for cooling purposes. During operation of the gun, the jacket remains stationary and prevents any object from interfering or rubbing against the barrel which moves during firing.

h. The recoil booster is attached to the front end of the jacket and locked in place with two small screws. It contributes to an increased rate of fire by momentarily confining the gas pressure at the muzzle which accelerates recoil of the barrel and barrel extension group.

98. DISASSEMBLY OF RECEIVER AND BARREL JACKET GROUP.

a. Remove the belt holding pawls, sleeve, and spring by withdrawing the belt holding pawl pin, being careful not to lose the springs.

b. If the Gun T36 has been set up for left-hand feed and a right-hand rear cartridge stop assembly is used (fig. 83), it is detached by removing the remaining belt holding pawl pin. This also frees the front cartridge stop. The right-hand rear cartridge stop assembly is disassembled by driving out the cartridge alining pawl pin, and removing the cartridge alining pawl, the alining pawl plunger, and spring. (If the right-hand rear cartridge stop assembly is not used, the front and rear cartridge stops and link stripper are removed by taking out the remaining belt holding pawl pin.)

NOTE: *The right-hand rear cartridge stop assembly is not used on the Gun T25E3.*

Figure 84 — Removing Switch and Switch Spring

c. If it is desired to remove the trunnion block cover for the installation of a sight, it can be detached by driving out the pins. Remove the cover detent pawl by pushing the pawl forward and taking out the cotter pin.

d. Remove the cotter pin from the switch pivot nut. Unscrew switch pivot nut and remove the switch and switch spring (fig. 84).

e. Remove the breech lock cam by taking the cotter pin out of the breech lock cam bolt which protrudes through the bottom of the receiver, and remove the nut. Withdraw the breech lock cam bolt and cam from the inside of the receiver.

NOTE: *The breech lock cam should not be removed, except for replacement.*

f. Remove the trigger bar pin assembly (Gun T36) by lifting the lock away from the side plate and rotating the pin about 90 degrees. The projection on the pin which forms a key will then pass through the keyway in the side plate and the pin can be removed by pulling it out from the gun. When the pin is removed, the trigger bar is free. Remove trigger bar from inside the receiver.

g. Remove recoil booster by unscrewing the two screws securing the booster to the jacket and unscrew the booster from the jacket.

99. ASSEMBLY OF RECEIVER AND BARREL JACKET GROUP.

a. Screw the recoil booster into the barrel jacket until the holes in the jacket and booster are in alinement. Insert and stake the two screws.

b. The trigger bar (Gun T36) with the long end forward and the bowed surface upward is placed between the top plate bracket and the bolt latch bracket, and held up firmly. The trigger bar should project approximately five-sixteenths inch beyond the rear trigger bar stop. With the trigger bar held in that position, insert the trigger bar pin, taking care to match the key on the pin with the keyway in the left side plate. After insertion, rotate the lock until stopped by the cover and push the lock down against the side plate.

c. If the breech lock cam has been removed or has to be replaced, it should be placed in the receiver with the cam surface up and to the rear. Place the lower projection of the cam through the hole in the bottom plate and insert the breech lock cam bolt from the top. Screw the castellated nut on the bolt with the notches or castellations towards the bottom surface of the bottom plate, and draw it tight. Line up the nearest castellation in the nut with the cotter pin hole in the bolt and insert the cotter pin.

d. The switch is installed by first inserting the bent end of the switch spring into the small hole in the switch recess of the left side plate. The spring is snapped into the recess. The back end of the switch is slid into the recess, holding the switch firmly against the side plate and making sure the lug on the back of the switch rides on top of the spring. Push the threaded protrusion through the hole in the side plate and secure it with the nut which should be drawn up firmly, but not forced. Loosen slightly, if necessary, to line up the castellations with the hole and insert the cotter pin. Try the switch to see that it pivots freely and snaps back into position. The cover detent pawl spring is slipped over the detent pawl guide and both are then inserted in the hole in the trunnion from the rear. If the trunnion block cover has been removed, it should be placed in position and the two pins inserted.

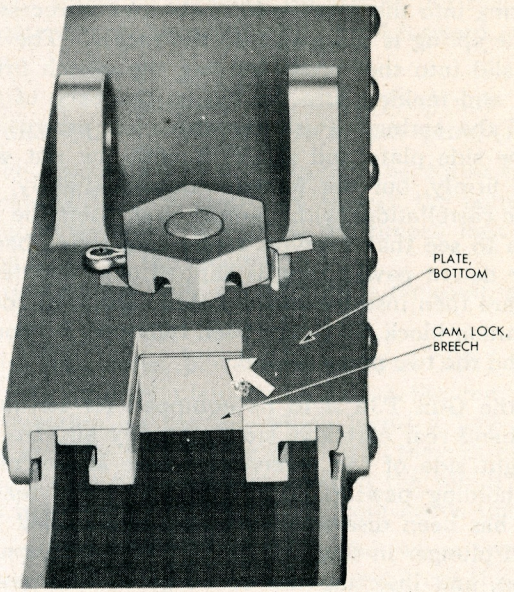
e. If the Gun T36 is to be equipped for left-hand feed, install the right-hand rear cartridge stop assembly and front cartridge stop on the right side of the receiver. These are secured by inserting the belt holding pawl pin. If the right-hand rear cartridge stop assembly has been disassembled, it is reassembled by inserting the spring and plunger in their recess, placing the cartridge alining pawl in position, and inserting the cartridge alining pawl pin (fig. 83). For left-hand feed, the belt holding pawls are placed in position on the left side of the receiver. Place the right-hand and left-hand pawls on the belt holding pawl sleeve, seat the springs, place the pawls and sleeve in position, and secure with the remaining belt holding pawl pin.

NOTE: *On the Gun T25E3 the front and rear cartridge stops are used for feeding from either the right- or left-hand side.*

100. ADJUSTMENT OF RECEIVER AND BARREL JACKET GROUP.

a. When the trigger bar is depressed (Gun T36), there should be a clearance of approximately 0.005 inch between the forward end of the trigger bar and the top of the bolt; the bar should not drag on the top of the bolt. If the trigger bar does drag on the top of the bolt, adjust as outlined in paragraph 17.

b. When the breech lock cam is properly assembled, it should float slightly to avoid any binding of the barrel extension in its guides in the cam. The clearance between the cam and the bottom plate should be between 0.001 inch and 0.008 inch, and should be measured with a feeler gage at the point indicated by the arrow in figure 85. If proper clearance cannot be provided with the nut drawn tight and the cotter pin inserted, try other nuts, bolts, or cams until such are found to give this clearance.



RA PD 73886

Figure 85 — Measuring Point for Breech Lock Cam Clearance

101. MAINTENANCE OF RECEIVER AND BARREL JACKET GROUP.

a. Carbon deposits may form in the booster and decrease the rate of fire of the gun. All carbon should be removed from the inside of the booster by scraping.

b. All dirt, burs, or foreign matter should be removed from under the breech lock cam.

c. The belt holding pawl springs must be replaced if weak or broken.

d. The barrel jacket should be replaced if bent and if it binds against the barrel.

e. The switch spring must be replaced if broken or weak.

f. If the belt holding pawl pin does not fit tightly or is broken, it should be replaced.

Section XXIII

OPERATING SLIDE GROUP (GUN T36)

102. GENERAL.

a. The operating slide group is used with the gun in some rigid installations. It provides for retraction of the bolt by hand and is used for loading, unloading, and clearing of stoppages in firing.

103. FUNCTIONING.

a. The operating slide is a horizontally sliding, hand-operated member supported by two guides which are attached by screws to the side plate (right or left) of the gun. The operating slide bar carries a hook forward of the middle which engages the bolt stud inserted in the bolt and projecting through the receiver side plate.

b. The bottom of the operating slide bar has two notches on its lower side which may be engaged against the rear guide to hold the bolt in one of two positions; either entirely to the rear, or slightly out of its foremost position.

104. REMOVAL OF OPERATING SLIDE GROUP.

a. To remove the slide from the gun, take out the locking wires and remove the operating slide guide screws and operating slide guides, front and rear.

105. INSTALLING OF OPERATING SLIDE GROUP.

a. Place the slide in position on the receiver side plate, assemble the front and rear guides over the slide bar, and insert the operating slide guide screws. Lock the screws with wire.

NOTE: *The two short screws are used in the front guide, the medium-length screw in the bottom hole of the rear guide, and the longest screw in the top hole of the rear guide.*

106. DISASSEMBLY OF OPERATING SLIDE GROUP (fig. 86).

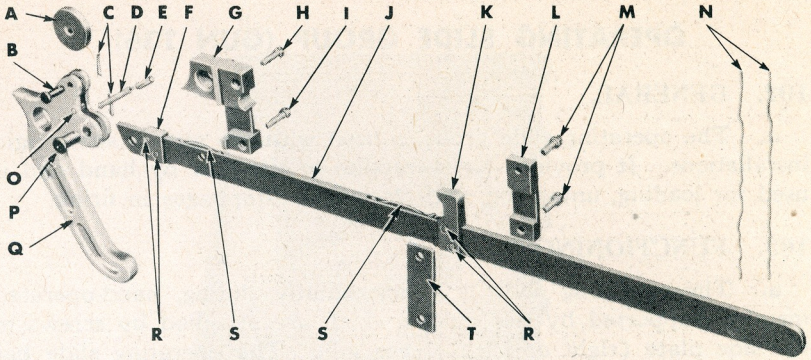
a. Withdraw cotter pin from operating slide roller pin, and remove roller.

b. Remove the cotter pin from the operating slide handle hinge pin, push out the hinge pin, and remove the slide handle, handle plunger, and plunger spring.

107. ASSEMBLY OF OPERATING SLIDE GROUP (fig. 86).

a. Replace the operating slide handle plunger spring, handle plunger, and handle, and insert the pin and cotter pin.

b. Place the operating slide roller in position; insert the roller pin and cotter pin.



A—ROLLER, OPERATING SLIDE
B—PIN, OPERATING SLIDE ROLLER
C—PIN, COTTER, SPLIT, S., BFAX1BB
D—SPRING, OPERATING SLIDE PLUNGER
E—PLUNGER, OPERATING SLIDE HANDLE
F—STOP, OPERATING SLIDE
G—GUIDE, OPERATING SLIDE, REAR
H—SCREW, OPERATING SLIDE GUIDE, REAR, UPPER
I—SCREW, OPERATING SLIDE GUIDE, REAR, LOWER
J—BAR, OPERATING SLIDE
K—HOOK, OPERATING SLIDE
L—GUIDE, OPERATING SLIDE, FRONT
M—SCREW, OPERATING SLIDE GUIDE, FRONT
N—WIRE, S., BFWX1A
O—PIN, STOP, OPERATING SLIDE HANDLE
P—PIN, HINGE, OPERATING SLIDE HANDLE
Q—HANDLE, OPERATING SLIDE
R—RIVET, S., CK-HD., 1/8 x 3/8
S—SPRING, OPERATING SLIDE
T—PIECE, BACK, OPERATING SLIDE GUIDE

RA PD 51029

Figure 86 — Operating Slide Group — Exploded View

108. ADJUSTMENT OF OPERATING SLIDE GROUP.

a. To avoid breakage of the operating slide guide screws, they must be kept tight at all times.

109. MAINTENANCE OF OPERATING SLIDE GROUP.

a. If the operating slide bar is bent, it should be straightened. If hook is loose or slide springs are weak or broken, the slide should be replaced.

b. Remove all burs, rough spots, or rust.

Section XXIV

RETRACTING SLIDE GROUP (GUNS T36 AND T25E3)

110. GENERAL.

a. The retracting slide group is used with many types of installations. It is used to retract the breech mechanism by hand for the purposes of loading, unloading, and clearing of stoppages in

firing. The retracting slide operates horizontally in guides of the bracket which is attached to the side plate (right or left). The slide engages the bolt stud which is inserted in the bolt and projects through a slot in the side plate.

111. FUNCTIONING.

a. When the gun is firing, the bolt stud reciprocates with the bolt; however, the retracting slide remains stationary and forward so there are no hazardous moving parts outside of the receiver.

112. DISASSEMBLY OF RETRACTING SLIDE GROUP (fig. 87).

a. Remove the retracting slide lever and spring from the bracket by pulling out the cotter pin and removing the nut and washer.

b. The grip and related parts may be attached to the lever in one of two ways, as follows:

(1) In some cases, they are attached to the lever by means of a solid bolt, staked in place. In such a case, remove the parts by unscrewing the bolt with a large screwdriver, forcing the staking.

(2) In some cases, they are attached by means of a hollow bolt with a split threaded end, into which a tapered pin is fitted. In such a case, before the bolt is unscrewed, a slender rod must be inserted in the hole in the bolt, and the tapered pin driven out.

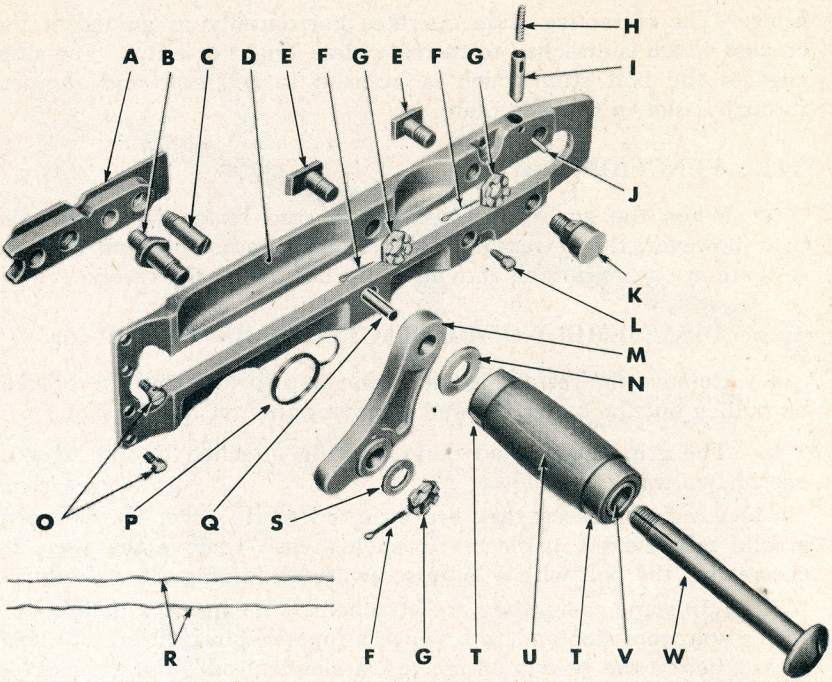
c. Withdraw the cotter pins, unscrew the nuts from the slide bracket bolts, and remove the bolts from the inside of the receiver. Then, withdraw the locking wires from the front and rear bracket screws; unscrew and remove the screws. The bracket assembly may then be removed from the side plate of the receiver and the slide assembly lifted out of the bracket.

d. Unscrew and remove the retracting slide lever stop from the slide assembly. The slide stud in the lower member of the bracket should not be removed.

e. The retracting slide plunger and spring are pinned in the bracket and should not be removed unless necessary. To remove, drive out pin and remove plunger and spring. Hold thumb over spring to prevent loss when removing pin.

113. ASSEMBLY OF RETRACTING SLIDE GROUP (fig. 87).

a. If the retracting slide plunger has been removed from the bracket, insert plunger, point leading, in hole in front top of bracket. Insert spring in plunger, aline pin slots in plunger with pinholes in bracket, and insert pin so that it bears on top of the spring. Depress spring with punch while inserting pin.



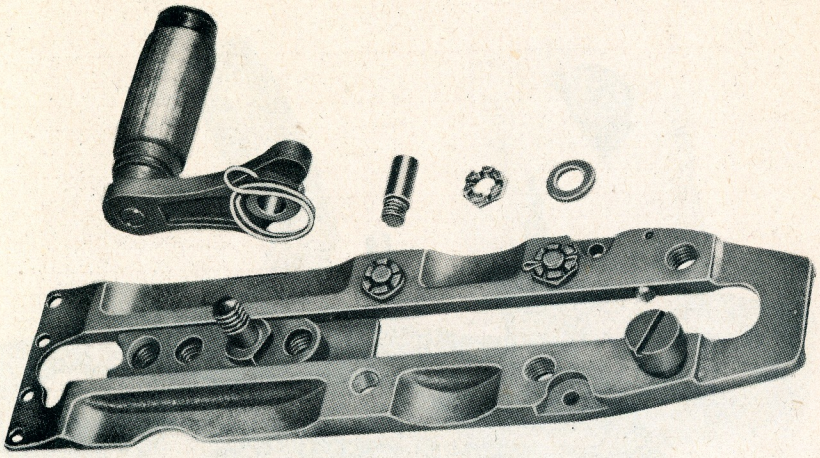
A—SLIDE, RETRACTING
B—STUD, RETRACTING SLIDE LEVER
C—STOP, RETRACTING SLIDE LEVER
D—BRACKET, RETRACTING SLIDE
E—BOLT, RETRACTING SLIDE BRACKET
F—PIN, COTTER, SPLIT, S., BFAX1BE
G—NUT, RETRACTING SLIDE
H—SPRING, RETRACTING SLIDE PLUNGER
I—PLUNGER, RETRACTING SLIDE
J—PIN, RETRACTING SLIDE PLUNGER
K—STUD, RETRACTING SLIDE
L—SCREW, RETRACTING SLIDE BRACKET, FRONT
M—LEVER, RETRACTING SLIDE
N—WASHER, RETRACTING SLIDE GRIP
O—SCREW, RETRACTING SLIDE BRACKET, REAR
P—SPRING, RETRACTING SLIDE LEVER, R. H.
Q—PIN, TAPER, NO. 4, BFCX1FB
R—WIRE, S., BFWX1A
S—WASHER, RETRACTING SLIDE LEVER STUD
T—FERRULE, RETRACTING SLIDE GRIP
U—GRIP, RETRACTING SLIDE
V—TUBE, RETRACTING SLIDE GRIP
W—BOLT, RETRACTING SLIDE GRIP, ASSY.

RA PD 51028

Figure 87 — Retracting Slide Group — Exploded View

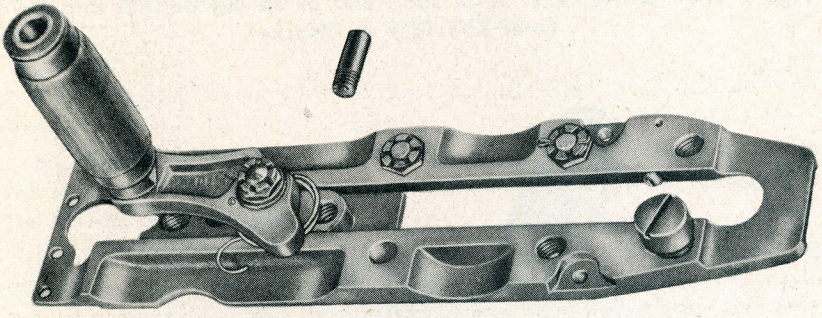
b. Place the slide assembly in the slideway in the inner side of the bracket so that the plunger in the bracket engages in the V-notch in the top of the slide, and the lever stud projects through the elongated stud slot in the bracket.

c. Assemble the grip washer and grip to the lever by inserting the grip bolt through grip and washer, and screwing into the lever so that the lug on the bottom of the lever will point to the rear (wide end of bracket) when assembled to the slide stud. If the bolt is of the hollow, split-end type, drive the taper pin tightly into the bolt



RA PD 61007

Figure 88 — Retracting Slide Group Partly Disassembled With Lever Spring in Place on Lever

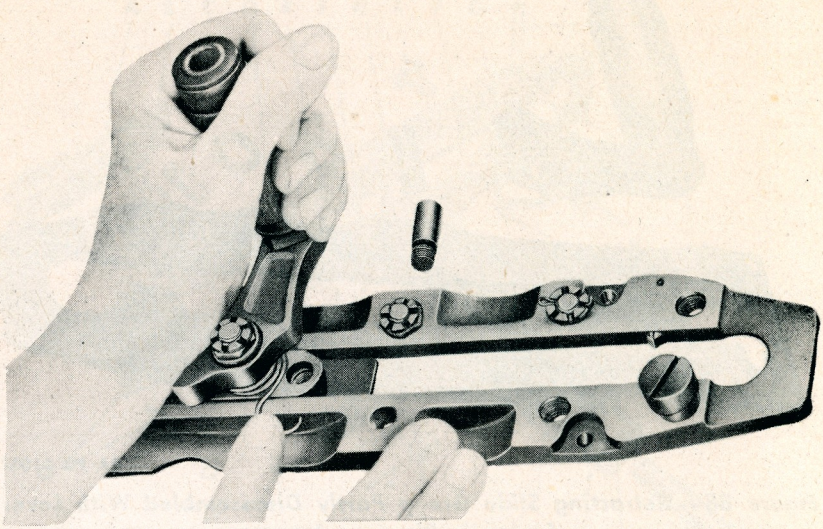


RA PD 61008

Figure 89 — Lever Assembled to Slide With Spring Encircling Lever Stud, and Bent Right-angle End of Spring Inserted in Hole in Lever

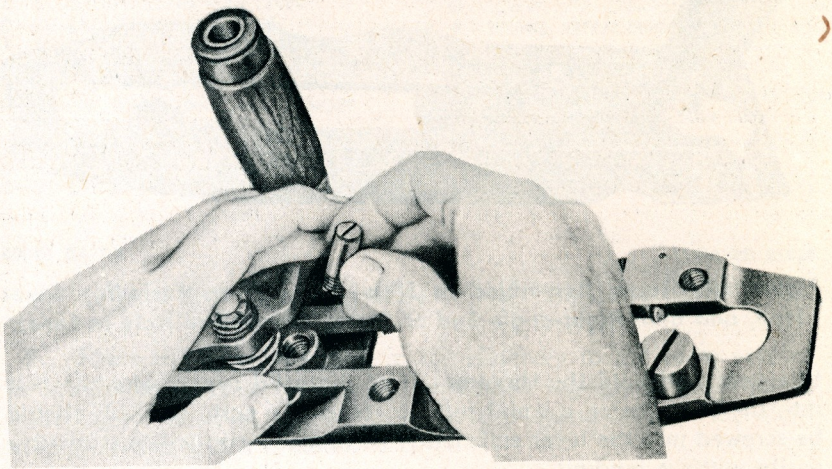
to spread and hold the threads. If of the solid type, stake the bolt into the lever, using a small punch. In either case, the bolt should be screwed into the lever sufficiently so that the grip will just revolve easily without binding.

d. With the slide in place in the slot, place the bracket on a flat bench or table with the front end toward the right of the assembler. The stop should not be assembled, but the lever stud should be in place. A cleat should be nailed to the bench on each



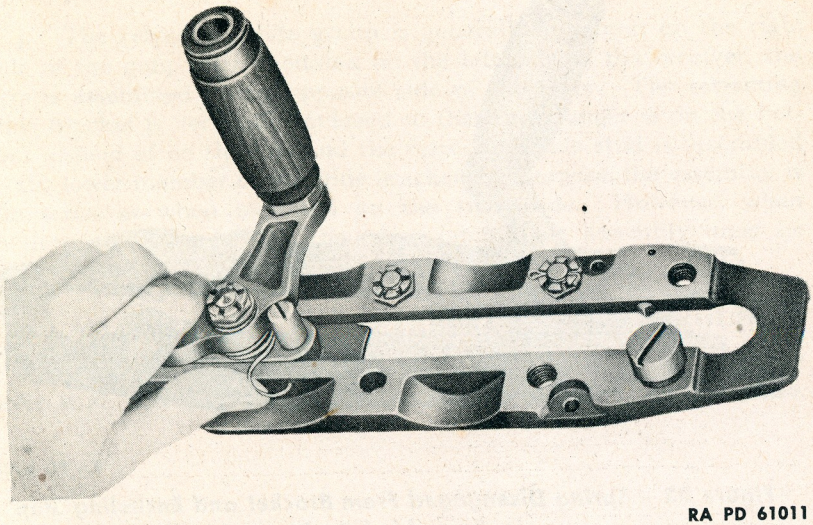
RA PD 61009

Figure 90 — Rotate Lever With Loop End of Spring Caught and Held Over Shoulder on Bracket



RA PD 61010

Figure 91 — Lever Rotated To Clear Stop Hole in Slide, and Lever and Spring Held Preparatory to Screwing Stop Into Slide



RA PD 61011

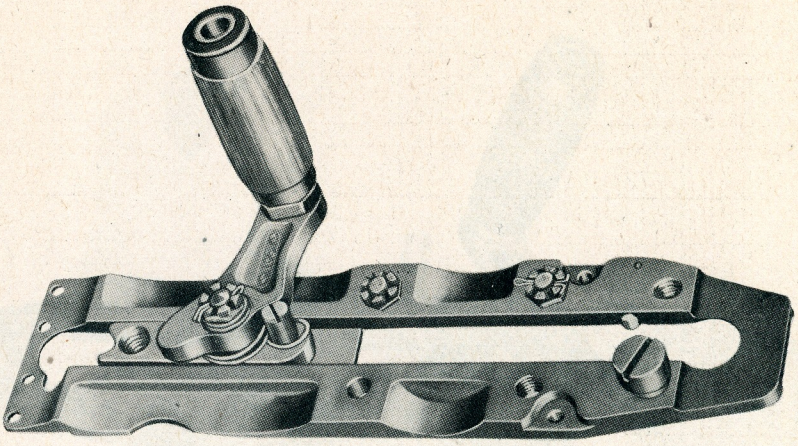
Figure 92 — Stop Screwed in Place With Lever Released Against Stop — Raise Loop of Spring To Release It From Bracket and Engage It With Stop

side of the bracket to prevent its rotating while in the process of assembly.

e. Place the spring under the lever while holding the lever in the left hand, and insert the bent right-angle end of the spring into the hole in the lever (fig. 88).

f. Place the lever down over the stud and then assemble the washer and nut, tightening the nut in place by hand (fig. 89). Rotate the lever in a direction to wind the spring catching the loop end on the shoulder on the bracket which constitutes the inner edge of the relief cut. Hook the end of the loop over the edge by pressing it down with a finger of the right hand (fig. 90). Hold this down while continuing to rotate the lever until the tang of the lever passes the tapped hole for the stop (fig. 90); then, with the left hand holding the lever and handle, and the thumb of the left hand holding the loop of the spring, assemble the stop and screw it in place (fig. 91).

g. Release the lever against the stop and raise the loop of the spring (fig. 92) until it snaps off the rib of the bracket and snaps around the stop (fig. 93). The loop may become slightly enlarged by this method of assembly, but this will not affect the functioning of the spring.



RA PD 61012

Figure 93 — Spring Disengaged From Bracket and Encircling Stop in Assembled Position

h. Insert the front and rear bracket bolts into the bolt slot in the side plate of the receiver so that the long beveled end of the lug on each bolt faces to the front and rear respectively and away from each other. Move the bolts apart as far as they will go and then position the retracting slide group on the side plate of the receiver so that the threaded portion of the bolts enter the bolt holes in the top member of the bracket. Screw nuts on bolts and draw down sufficiently to hold bolts in position. (When assembled, the beveled end of the bolt lugs should seat in the beveled slots in the inner face of the side plate to prevent longitudinal movement of the bracket.) The bolt nuts should not be drawn tight until the bracket screws have been positioned in bracket and receiver. The bracket bolts are best positioned by sliding the (breech) bolt into the rear end of the receiver to hold the bolts in their seats in the side plate while assembling. One bolt may be loosely assembled in the bracket, if desired, to facilitate assembly.

i. Screw in front (long) and rear (short) bracket screws and draw down tight, alining holes in head of screws so that locking wires can be inserted easily. Thread one locking wire through the two rear bracket screw heads, draw tight, twist ends, and fold in. Thread the other wire through the front screw head and the hole in the slide stud, and fasten likewise. Then, tighten nuts on bracket bolts, aline pinholes, insert cotter pins, and spread prongs. Bend prongs snugly around nuts to prevent any interference. Be sure the *long* bracket

screw is assembled in the *front* hole, and that screws do not protrude into receiver to interfere with removal or installation of buffer group.

j. The retracting slide group is generally mounted on the right side of the gun; when mounted on the left side of the receiver, the grip is assembled to the opposite side of the lever. The retracting slide bracket is vertically reversed so that the plunger is on the bottom instead of on the top, and the retracting slide stud is assembled to the lower member of the slide bracket. Otherwise, the assembly is the same as when mounted on the right side. However, when mounted to the left side, the cover latch shaft assembly must be assembled to the right side to avoid interference.

114. MAINTENANCE OF RETRACTING SLIDE GROUP.

a. Make sure that the retracting slide lever stop, retracting slide lever stud, and the retracting slide stud are firmly staked in place.

PART FOUR — AUXILIARY EQUIPMENT

Section XXV

GENERAL

115. SCOPE.

a. Part four contains information for the guidance of the personnel responsible for the operation of this equipment. It contains only the information necessary to using personnel to properly identify, connect, and protect such auxiliary equipment while being used or transported with the main equipment. Detailed instructions pertaining to auxiliary equipment are contained in TM's.

Section XXVI

AMMUNITION

116. GENERAL.

a. The information in this section pertaining to the several types of cartridges authorized for use in these guns includes a description of the cartridges, means of identification, care, use, and ballistic data.

117. CLASSIFICATION.

a. The principal classifications of ammunition for this machine gun are: Ball, armor-piercing, armor-piercing-incendiary, incendiary, tracer, armor-piercing-incendiary-tracer, and headlight tracer. Other types provided for special purposes are: blank, and dummy.

118. IDENTIFICATION.

a. General. Even though the cal. .50 cartridges are not marked or stamped to indicate the type or model, each type may be identified as described below. In general, the only stamping on the cartridge is that of the manufacturer's initials and the year of loading which appear on the base of the cartridge case; however, the marking on all original packing containers, both boxes and cartons, clearly and fully identifies the ammunition, except as to grade (subpar. **f**, below). Nevertheless, the code symbol stenciled on boxes indicates the grade. In addition to the marking, stenciled figure symbols on the ammunition boxes indicate the type of packing. Color bands were formerly painted on boxes and printed on carton labels to provide a ready means of identification as to type; their use has been discontinued.

AMMUNITION

b. Types. When removed from their original packing containers, the cartridges may be identified, except as to ammunition lot number and grade, by physical characteristics as described below and illustrated in figures 94, 95, and 96. See also figures 98 and 99. Care should be taken not to confuse these original markings with any subsequent markings made with lithographic marking ink, which is used to identify lots during target practice (subpar. **h**, below).

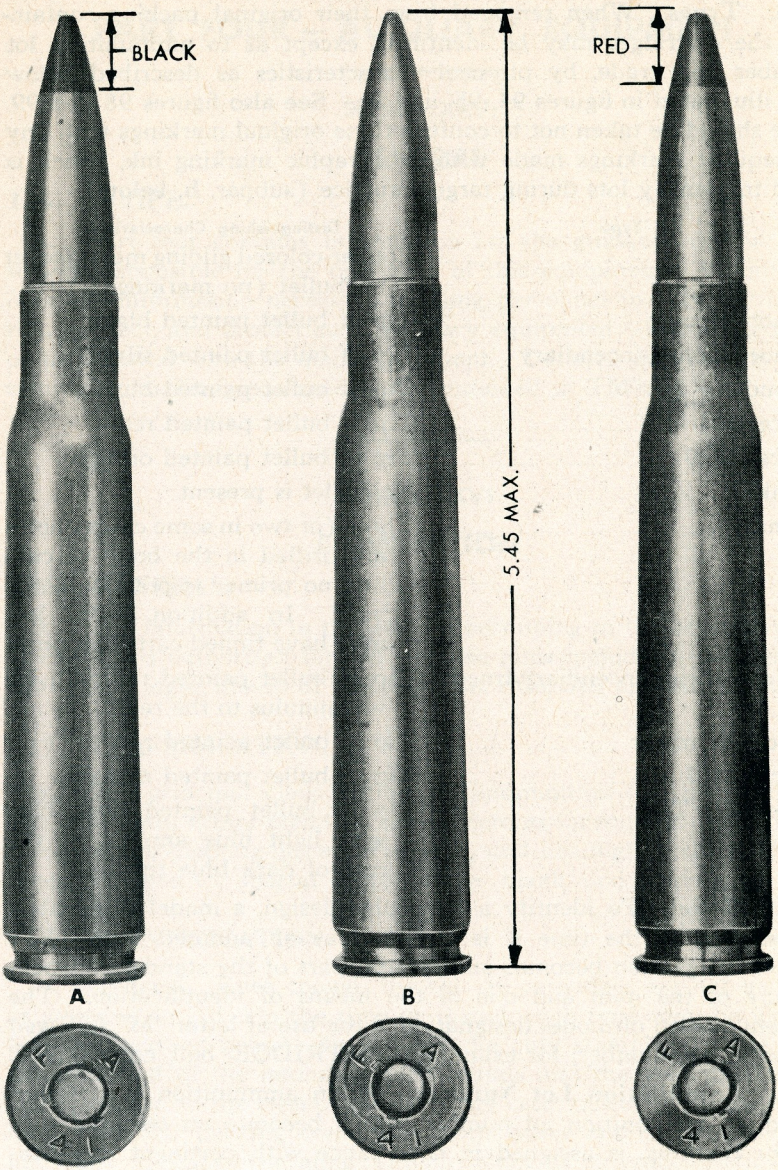
Type	Distinguishing Characteristics
Ball	Copper-colored gilding metal jacket on bullet (no markings).
Armor-piercing	Tip of bullet painted black.
Armor-piercing-incendiary	Tip of bullet painted silver.*
Incendiary M1	Tip of bullet painted blue.
Tracer M1	Tip of bullet painted red.
Tracer M10	Tip of bullet painted orange.
Blank	No bullet is present.
Dummy	Three (or two in some cases) holes are drilled in the body of case and no primer is present in the base. In addition, older lots may have tinned cartridge cases.
Armor-piercing-incendiary-tracer	Tip of bullet painted red with silver annulus to the rear.
Headlight tracer	Tip of bullet painted red.
Tracer M17	Tip of bullet painted maroon.
Incendiary T48	Tip of bullet painted dark blue with light blue annulus at the rear of dark blue tip.

c. Model. To identify a particular design, a model designation is assigned at the time it is classified as an adopted type. The model designation becomes an essential part of the standard nomenclature of the item and one of the means of identification. The present system of model designation is the use of letter "M" followed by an arabic number; for example, CARTRIDGE, ball, cal. .50, M2.

d. Ammunition Lot Number. When ammunition is manufactured, an ammunition lot number, which becomes an essential part of the marking, is assigned in accordance with pertinent specifications. This lot number, or the repacked lot number (subpar. **e**, below), is marked on all packing containers. It is required for all purposes of record, including grading and use, reports on condition, functioning, and accidents in which the ammunition might be

*Early lots of Armor-piercing-incendiary Cartridge, Cal. .50, T16 which has been standardized as the Armor-piercing-incendiary Cartridge, Cal. .50, M8 were blue-tipped with a black annulus at the rear. Later lots were silver-tipped.

BASIC AIRCRAFT MACHINE GUNS, CAL. .50, T36 AND T25E3



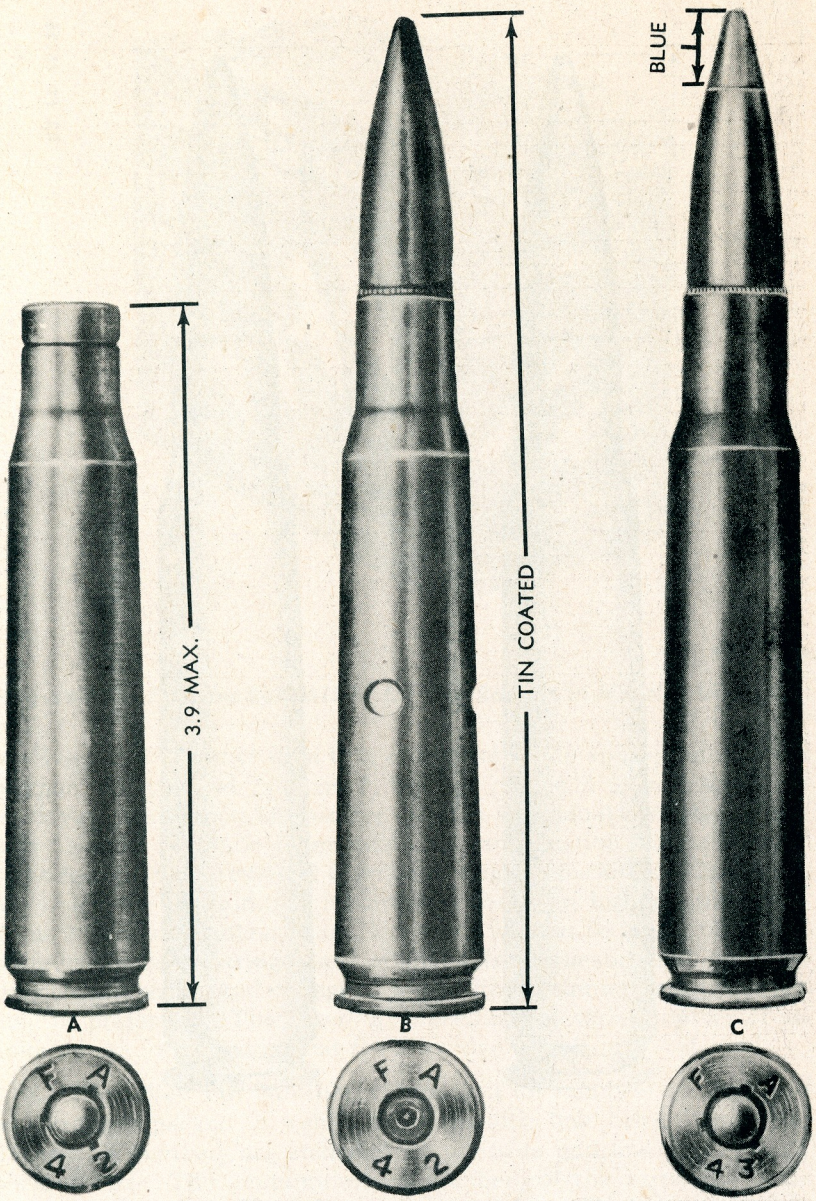
A—CARTRIDGE, ARMOR-PIERCING CAL. .50, M2

B—CARTRIDGE, BALL, CAL. .50, M2,

C—CARTRIDGE, TRACER, CAL. .50, M1

RA PD 2117

Figure 94 — Caliber .50 Cartridges

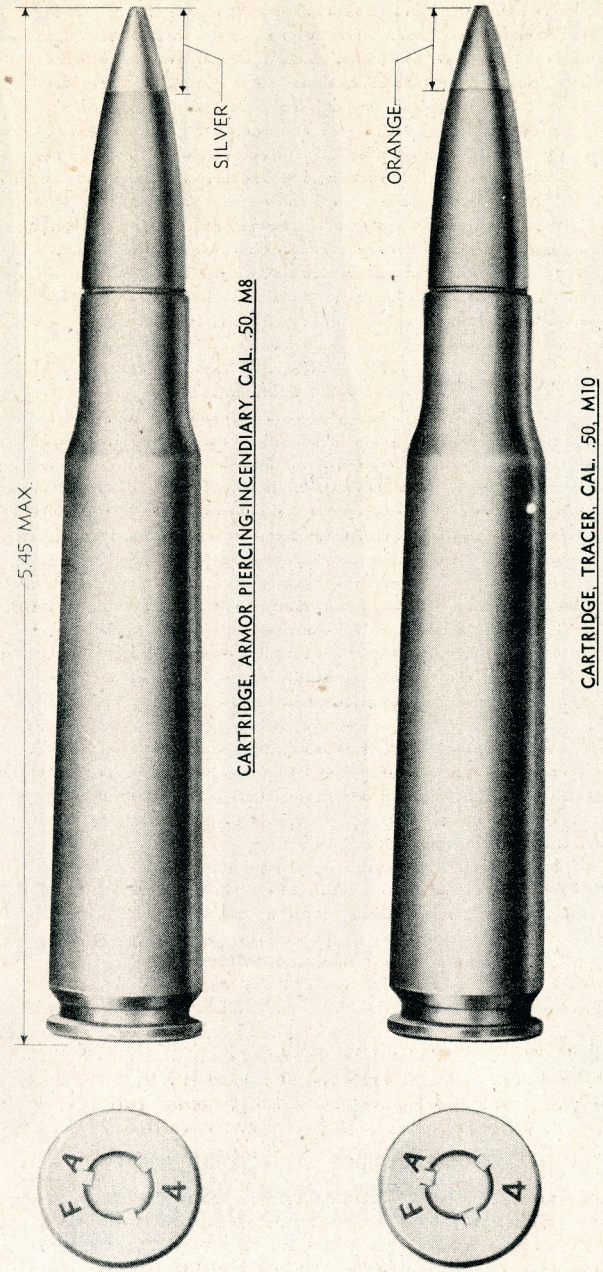


A — CARTRIDGE, BLANK, CAL. .50, M1
B — CARTRIDGE, DUMMY, CAL. .50, M2
C — CARTRIDGE, INCENDIARY, CAL. .50, M1

RA PD 64450A

Figure 95 — Caliber .50 Cartridges

BASIC AIRCRAFT MACHINE GUNS, CAL. .50, T36 AND T25E3



RA PD 15126

Figure 96 — Caliber .50 Cartridges

RA PD 61215A

Figure 97 — Packing Box M1917 for 265 Rounds in Metallic Link Belt

involved. No lot other than that of current grade appropriate for the weapon will be fired (subpar. f, below). Since it is impractical to mark the ammunition lot number on each individual cartridge, every effort should be made to maintain the ammunition lot number of cartridges that are removed from their original packings. Cartridges for which the ammunition lot number has been lost are placed in grade 3 (unserviceable ammunition which will not be issued or fired); therefore, when cartridges are removed from the original packings they should be marked or tagged so that the ammunition lot number may be preserved. The letter "S" preceding the serial number of an ammunition lot indicates that the cartridge case is made of steel.

e. Repacked Lot Number. Repacked lot numbers are assigned to cartridges packed in web belts or metallic link belts. These repacked lot numbers are stenciled on one side and one end of each packing box. The ammunition lot numbers of the cartridges comprising a repacked lot are listed on a reference card placed inside the packing box.

f. Grades. Small-arms ammunition is graded primarily on the qualities which make the lot especially suited for use in a particular class of small-arms weapons; for example, a lot of ammunition as-

signed grade AC is especially suited for use in aircraft weapons. Current grades of all existing lots of small-arms ammunition are established by the Chief of Ordnance and are published in WDSB 9-AMM 4. Only those lots of appropriate grade will be fired. Grade 3 indicates unserviceable ammunition which will not be issued or fired; however, ammunition placed in grade 3 due to loss of lot number, but which can be identified as having been in serviceable lots issued to a specific organization, may be reissued after visual inspection, but only for local training purposes in ground machine guns.

g. Marking. In addition to markings on packing boxes required for shipping purposes, the following are also stenciled or marked on the boxes (fig. 97 illustrates an older type box):

*(1) Repacked lot numbers appear in place of the ammunition lot number on packing boxes or crates containing ammunition packed in linked belts or web belts. The repacked lot number consists of the words "REPACKED LOT"; the initials of the repacker; letter B or L, for belted or linked cartridges, respectively; and the lot number assigned by the repacker.

(2) Markings stenciled on the box indicate the type, or types and ratio, of the cartridges within the box; for example, "4 BALL M2, 1 TR M1."

(3) Stenciled figure symbols on the sides and ends of packing boxes containing cartridges in web belts and linked belts indicate the type of inner packing; for example, for cartridges packed in metallic link belts, the symbol indicated in figure 97 (one of the older type boxes) is used. The absence of stenciled figure symbols indicates that the ammunition is packed in cartons.

(4) Code symbols (Ammunition Identification Code), as published in ORD 11 SNL T-1, are also stenciled on packing boxes. These code symbols indicate a specific cartridge, or combination of cartridges, having a specific grade and packing. For published and authorized code symbols, see ORD 11 SNL T-1.

h. Lithographic Marking Ink. The number of hits made upon a target by a certain machine gun or group of machine guns when others are firing upon the same target is sometimes determined by coating the tips of the bullets with lithographic ink. The bullets from each weapon or group of weapons are coated with a distinctive color of ink which, upon striking the target, leaves a smear indicating the source of fire. For method of application, see TM 9-855. Cartridges which have been so coated must have the ink removed before return to storage.

119. PACKING.

a. Recent lots of cal. .50 service cartridges are packed as indicated below. The data indicated may vary, dependent upon the particular lot. Figure 97 illustrates one of the older type packing

boxes. For additional packing data, see ORD 11 SNL T-1 and ORD 11 SNL T-5.

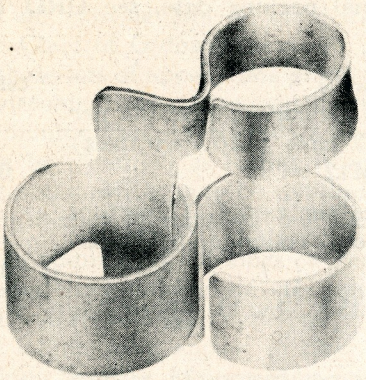
Packing	Cubic Feet	Weight (Pounds)
Packed 10 cartridges per carton, 6 cartons per metal can, M10, 2 cans (120 cartridges) per wooden box, M12.	0.65	44
Packed 10 cartridges per carton, 12 cartons per waxed container, 2 containers (240 cartridges) per box.	1.12	79
Dimensions of box: $15\frac{3}{16}$ by $13\frac{15}{16}$ by $9\frac{1}{8}$ inches.		
Packed 10 cartridges per carton, 35 cartons (350 cartridges) per metal-lined box.	1.49	112
Dimensions of box: $18\frac{7}{16}$ by $14\frac{13}{16}$ by $9\frac{7}{16}$ inches.		
Packed 60 cartridges in metallic link belt, 1 belt per waxed container, 4 containers (240 cartridges) per metal-lined box.	1.49	87
Dimensions of box: $18\frac{7}{16}$ by $14\frac{13}{16}$ by $9\frac{7}{16}$ inches.		
Packed 265 cartridges in metallic link belt, 1 belt per metal-lined box.	1.49	100
Dimensions of box: $18\frac{7}{16}$ by $9\frac{7}{16}$ by $14\frac{13}{16}$ inches.		

120. CARE, PRESERVATION, AND HANDLING.

a. Small-arms ammunition, as compared with other types of ammunition, is not dangerous to handle. Care, however, must be observed to keep the packing cases from becoming broken or damaged. All broken cases must be immediately repaired and careful attention given to the transfer of all markings to the new parts of the box. In case the box contains a metal liner, it should be air-tested and sealed, provided that equipment for this work is available.

b. Ammunition boxes should not be opened until the ammunition is required for use. Ammunition removed from its container, particularly in damp climates, may become corroded, thereby causing the ammunition to become unserviceable.

c. The ammunition should be protected from mud, sand, dirt, and water. If it gets wet or dirty, it should be wiped off at once. If verdigris or light corrosion forms on cartridges, it should be wiped off with a clean, dry wiping cloth; however, cartridges should not be polished to make them look better or brighter.



RA PD 61183

Figure 98 — Metallic Link Belt, Cal. .50, M2

d. The use of oil or grease on cal. .50 cartridges is prohibited.

e. Ammunition should not be exposed to the direct rays of the sun for any length of time. Such exposure may seriously affect its firing qualities.

f. Whenever cartridges are taken from original packing containers, they will be tagged or otherwise marked so that the ammunition may be identified as to lot number. Such identification is necessary to prevent otherwise serviceable ammunition from being placed in grade 3, through loss of lot number.

121. PRECAUTIONS IN FIRING.

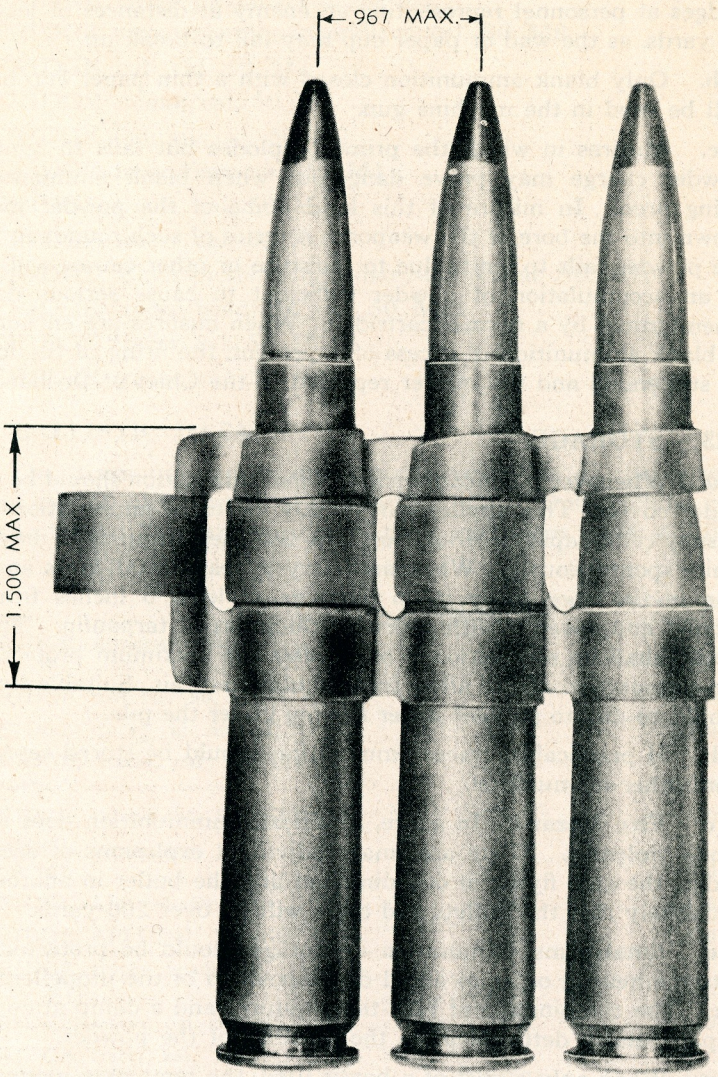
a. Ammunition which is seriously corroded should not be fired.

b. Do not fire cartridges having nonpermissible dents or scratches, cartridges with loose bullets, or otherwise defective rounds.

c. No cal. .50 ammunition will be fired until it has been positively identified by ammunition lot number and grade as published in the latest revision or change to WDSB 9-AMM 4.

d. Before firing, the firer should be sure that the bore of the weapon is free of any foreign matter such as gun-cleaning patches, oil, grease, mud, sand, snow, and the like. To fire a weapon with any obstruction in the bore may cause the gun to burst, and result in injury to personnel.

e. Do not fire oiled or greased cartridges without first removing the oil or grease with a clean, dry wiping cloth, nor those which have become overheated due to exposure to the direct rays of the sun or other sources of high temperature. Such cartridges, if fired, may develop hazardous chamber pressures.



RA PD 61184A

Figure 99 — Section of Linked Belt Loaded With Armor-piercing Cartridge, Cal. .50, M2

BASIC AIRCRAFT MACHINE GUNS, CAL. .50, T36 AND T25E3

122. PRECAUTIONS IN FIRING BLANK AMMUNITION.

a. It is dangerous to fire machine guns loaded with blank cartridges at personnel representing an enemy at distances of less than 20 yards, as the wad or paper cup may fail to break up.

b. Only blank ammunition closed with a thin paper cup or wad will be used in the machine gun.

c. Misfires in which the primer explodes but fails to ignite the powder charge may prove dangerous when blank ammunition is being fired. In misfire of this kind, some of the powder may be blown into the bore of the weapon. A series of such rounds in which the powder fails to ignite due to moisture or other causes will result in an accumulation of powder sufficient to cause serious damage when ignited by a normal cartridge. When misfires are encountered in blank ammunition in excess of 5 percent, the firing of the lot will be suspended and the matter reported to the Chief of Ordnance.

123. STORAGE.

a. Whenever practicable, small-arms ammunition should be stored under cover. This applies particularly to tracer ammunition which is subject to rapid deterioration if it becomes damp, and may even ignite spontaneously. When necessary to leave small-arms ammunition in the open, raise it on dunnage at least 6 inches from the ground and cover it with a double thickness of tarpaulin. The tarpaulin shall be so positioned as to offer the maximum protection to the ammunition and to allow free circulation of air. Suitable trenches should be dug to prevent water flowing under the pile.

b. If practicable, tracer ammunition should be stored separately from other ammunition.

c. Fire Hazard. In a fire, small-arms ammunition does not explode violently. There are small individual explosions of each cartridge, the case flying in one direction and the bullet in another. It is unlikely that the bullets and cases will fly over 200 yards.

d. Small-arms ammunition in storage should be protected from extreme heat in order to avoid decomposition of the propellent powder. The combination of high temperatures and a damp atmosphere is particularly detrimental to the stability of the powder.

e. When only a part of a box is used, the remaining ammunition in the box should be protected against unauthorized handling and use by firmly fastening the cover in place.

124. AUTHORIZED ROUNDS.

a. The following ammunition of appropriate grade (par. 118) is authorized for use in these guns. It will be noted that the nomencla-

ture (standard nomenclature) completely identifies the cartridge as to type, caliber, and model (figs. 94, 95, and 96).

CARTRIDGE, armor-piercing, cal. .50, M2
CARTRIDGE, armor-piercing-incendiary, cal. .50, M8
CARTRIDGE, ball, cal. .50, M2
CARTRIDGE, blank, cal. .50, M1
CARTRIDGE, dummy, cal. .50, M2
CARTRIDGE, incendiary, cal. .50, M1
CARTRIDGE, tracer, cal. .50, M1
CARTRIDGE, tracer, cal. .50, M10
CARTRIDGE, armor-piercing-incendiary-tracer, cal. .50, M20
CARTRIDGE, tracer, headlight, cal. .50, M21
CARTRIDGE, tracer, cal. .50, M17
CARTRIDGE, tracer, cal. .50, T48

125. BALLISTIC DATA.

a. The maximum ranges and muzzle velocities of the service types of cal. .50 ammunition authorized for use in this machine gun are given below. The trajectories of these cartridges cross at 1,000 yards.

Cartridges	Elevation (degrees)	Muzzle Velocity f/s (36-inch barrel)	Maximum Range (yards)
CARTRIDGE, armor-piercing, cal. .50, M2	35	2,840	7,350
CARTRIDGE, ball, cal. .50, M2	35	2,840	7,350
CARTRIDGE, tracer, cal. .50, M1[1]	30	2,730	5,470
CARTRIDGE, tracer, cal. .50, M1 (alternate)[1]	30	2,890	5,400
CARTRIDGE, tracer, cal. .50, M10[2]	35	2,890	5,400
CARTRIDGE, incendiary, cal. .50, M1	35	2,980	6,000
CARTRIDGE, API, cal. .50, M8	30	2,950	6,375
CARTRIDGE, APIT, cal. .50, M20[3]	30	2,950	6,375
CARTRIDGE, tracer, headlight, cal. .50, M21[4]	30	2,890	5,300
CARTRIDGE, tracer, cal. .50, M17[5]	30	2,730	5,470
CARTRIDGE, tracer, cal. .50, M17 (alternate)[5]	30	2,890	5,400
CARTRIDGE, incendiary, cal. .50, T48	—	3,450	—

[1]Trace to 1,600 to 1,800 yards.
[2]Dim trace to 100 yards and bright to 1,600 to 1,800 yards.
[3]Trace to 1,600 to 1,800 yards; cartridge has a red tip with silver annulus at the rear; other characteristics identical to those of CARTRIDGE, API, cal. .50, M8.
[4]Trace to 500 to 600 yards; brilliant trace, visible from the target; cartridge has red tip.
[5]Trace to 2,500 yards.

BASIC AIRCRAFT MACHINE GUNS, CAL. .50, T36 AND T25E3

126. DEFECTS FOUND AFTER FIRING SMALL-ARMS AMMUNITION.

Name of Defect	How To Recognize	Common Causes — Precautions
Misfire.	No action on firing. Primer shows normal impression of firing pin.	Primer is defective.
	No action on firing. Primer shows light impression of firing pin.	Indicates mechanical defect in weapon as short or broken firing pin, weak firing pin spring, bolt of weapon not being completely locked, or grease in firing pin hole which cushions blow of firing pin; or caused by defective cartridge or primer.
	No action on firing. Primer shows normal impression of firing pin, but off center.	Defect in weapon.
Hangfire.	Delayed ignition of powder in the cartridge.	Small or decomposed primer pellet, damp powder or light blow of firing pin caused by dirt or defect in weapon. This is a serious defect if delay is long enough to permit the bolt to be opened before the powder burns completely, in which case injury to firer or damage to weapon, or both, may result.
Pierced primer.	Perforation of primer cup by the firing pin. Discoloration around indent of very small perforation. Disk from large perforation blown into action of gun, with such an escape of gas as to lower velocity of the shot.	Imperfect firing pin or very thin metal in base of primer cup.
Primer leak.	Discoloration around the primer and the head. Slight discoloration when primer leak is small, or heavy for a large primer leak.	Too small a primer, too large a primer hole, or excessive pressure generated by propelling charge.
Blown primer.	Primer is blown completely from pocket of cartridge case.	Serious defect but seldom encountered.
Primer setback.	Primer protrudes above the metal head.	Defective bolt or cartridge, or excessive pressure.
Leak back of case.	Discoloration along body of cartridge case.	Escape of gas into the action of weapon.
Failure of case to extract.	Failure of case to extract.	Defective extractor or cartridge.
Blowback.	Escape of gas to the rear.	Pierced primer, primer leak, blown primer, and ruptured cartridge case.

AMMUNITION

Name of Defect	How To Recognize	Common Causes — Precautions
Split neck.	Neck of case splits and is accompanied by escape of gas to the rear, upon firing.	Not to be confused with a split neck due to season cracking which can be observed before firing.
Split body.	Longitudinal split in body of case, thereby reducing velocity of the shot.	Case of body made of defective material or has a deep draw scratch.
Stretch.	Continuous ring around the body of a fired cartridge case.	Generally due to improper headspace.
Complete rupture.	Circumferential separation completely around body of cartridge case, causing it to separate into two parts.	Bad bolt locking, excessive headspace, or defective cartridge case. This is a serious defect, because if the forward portion of case remains in the chamber after extraction, it will cause the next round to jam.
Partial rupture.	Partial circumferential separation around body of cartridge case.	See "Complete rupture."

APPENDIX

Section XXVII

STORAGE AND SHIPMENT

127. PREPARATION FOR SHIPMENT.

a. General. Preparation of the Machine Guns, Cal. .50, T36 and T25E3 for domestic shipment and limited storage will be the same.

b. Lubrication. Lubricate materiel as directed in section XII.

c. Cleaning. Before storage and shipment, all uncoated parts and assemblies will be thoroughly cleaned with dry-cleaning solvent or a soap solution. Disassembly will be in accordance with instructions outlined in part three. After cleaning and drying surfaces, do not touch with bare hands. Use clean canvas cloth or synthetic rubber gloves.

(1) SOLVENT METHOD.

(a) Apply dry-cleaning solvent by scrubbing with a brush or wiping with a clean saturated cloth. Repeat application with clean solvent until all traces of foreign matter have been removed.

(b) Dry surfaces thoroughly with clean, dry cloths or with dry compressed air.

(2) SOAP-SOLUTION METHOD.

(a) Prepare soap solution as follows: Add shavings of issue soap to water, in the proportion of 1 pound of soap to 4 gallons of water. Heat the water until the soap is dissolved, stirring the water slowly to prevent foaming.

(b) Apply soap solution by brushing or scrubbing the surfaces thoroughly until all traces of foreign matter are removed.

(c) Rinse surfaces thoroughly with clean hot water to remove soap, and immediately dry with clean dry cloths or with dry compressed air.

d. Preservation of Machine Guns.

NOTE: *Application of preservative will be accomplished immediately after cleaning and drying. Rust-preventive compound (light) specified herein will be heated until the proper consistency of flow is attained.*

(1) Apply a coating of rust-preventive compound (light) to parts and assemblies by dipping, spraying, or brushing until all surfaces have an even, unbroken protective film.

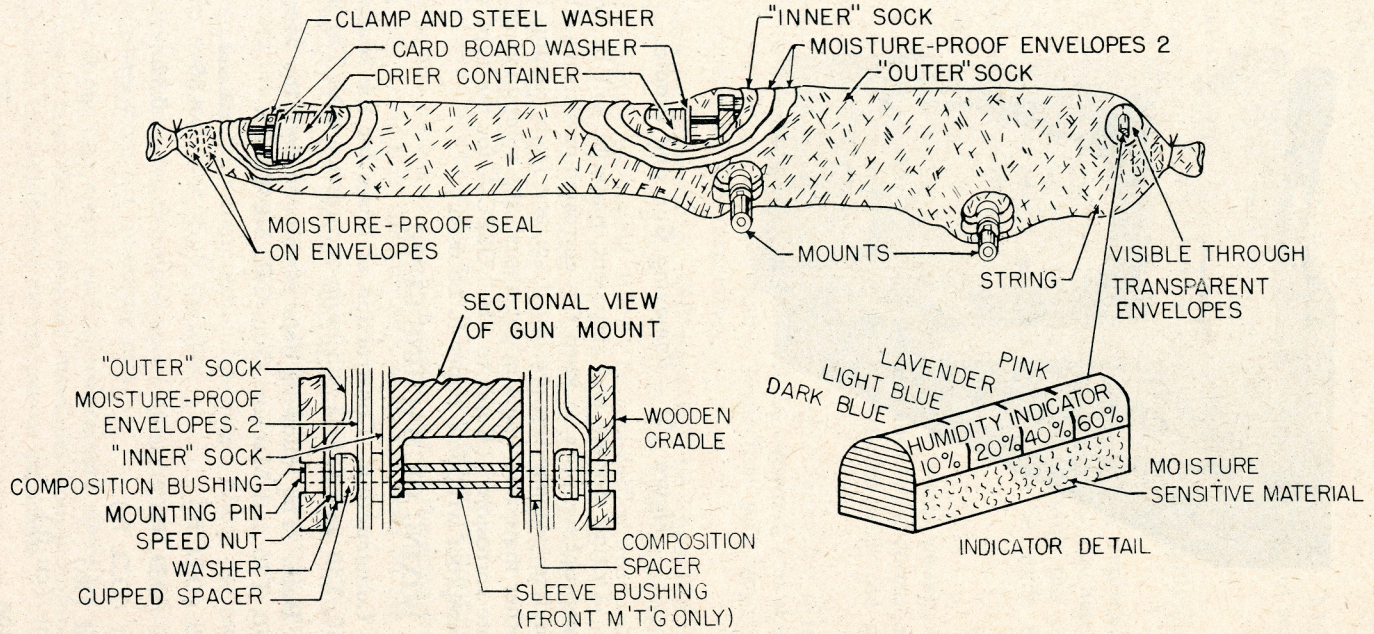
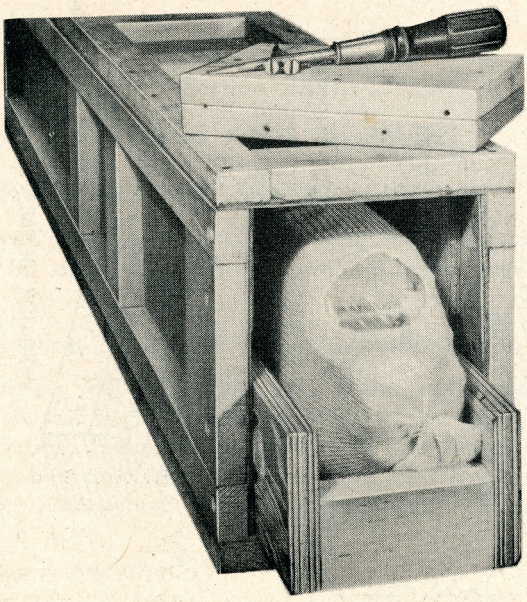


Figure 100 — Details of Moistureproof Package



RA PD 80252

Figure 101 — Removing Gun and Cradle

(2) During storage and shipment, materiel will be wrapped in a greaseproof wrapper to keep the corrosion-preventive film on the part and to prevent the preserved surface from coming in contact with other materials which might absorb the compound or otherwise promote corrosion. (Refer to SB 9-OSSC-A for the type and grade of greaseproof wrapping paper to be used.)

128. BOXING OF MACHINE GUNS.

a. Construction. Construction of boxes for the Machine Guns, Cal. .50, T36 and T25E3 will be in accordance with TM 9-2854.

b. Data. The following data pertains to both the Machine Gun, Cal. .50, T36 and Machine Gun, Cal. .50, T25E3.

	Unboxed	Boxed
Length (O.D. ft)	4.85	5.30
Width (O.D. ft)	0.32	0.66
Height (O.D. ft)	0.57	0.84
Weight (lb)	62	97
Volume (cu ft)	—	2.9
Ship ton	—	0.072

STORAGE AND SHIPMENT

129. STORAGE.

a. Limited Storage (Periods Less Than 30 Days). Materiel in limited storage is that materiel which is temporarily out of service, or materiel that must be ready for operation on call.

(1) PREPARATION.

(a) Before being stored, machine guns will be thoroughly cleaned and preserved as specified in paragraph 127.

(b) All missing or broken parts will be promptly replaced and repaired. If repairs cannot be made prior to placing machine guns in storage, a tag will be attached to guns specifying the repairs needed, and a written report of these items will be made to the officer-in-charge of the materiel.

(2) INSPECTION.

(a) A visual inspection of the guns will be made weekly to determine general appearance, and any parts found to be corroding will have the rust spots removed and will be treated with the proper preservative.

(b) Upon removal from storage, any items noted by a tag attached to guns as still needing repairs will be repaired, and the guns will be given a complete maintenance inspection plus any repairs which are indicated by this inspection.

b. Unpacking Procedure. All guns will be unpacked as described below. The packing box, as well as the other material comprising the complete packaging, should be retained, stored, and protected from the weather until a sufficient quantity is on hand for reshipment. Shipping instructions for the return of packing materials which are no longer needed are issued by the Office, Chief of Ordnance. The unpacking procedure is as follows:

(1) Remove the end of the box which is screwed in position.

(2) Slide the packaged gun and cradle out of the shipping container (fig. 101), and turn the gun over so that it rests on the top of the receiver.

(3) Remove the two screws holding one side of the cradle to the rear crosspiece; spread the cradle to release the mounting pins and bushings from the mounting holes.

(4) Remove the four composition bushings. Untie the rear end of the outer sock and slide it off the gun.

(5) Carefully remove the metal speed nuts, cupped steel spacers, and steel washers from the mounting pins.

(6) Cut off the rear end of each moistureproof envelope as close to the seal ring as possible. Disengage envelopes from mounting pins. Carefully remove the envelopes; do not tear or puncture.

CAUTION: *The inner envelope is sealed to the composition spacers around each mounting pin with a nonhardening adhesive and must be removed carefully to prevent tearing.*

(7) Remove the humidity indicator.

(8) Do not handle the gun with bare hands. Wear gloves.

(9) Untie the rear end of the inner sock and slide it off the gun.

(10) Remove the clamp, the retaining washers, and the drier container from the barrel jacket. Place the container in the moisture-proof envelope (position it so that it occupies that section of the envelope which enclosed the barrel end of the gun) and seal it by tying the envelope close to the container ends.

(11) Remove the mounting pin from the rear mounting holes, and the pin and sleeve bushing from the front mounting hole. If pins have become bent during shipment, straighten them before removing them.

(12) Remove the back plate and then remove the oil-impregnated hardwood block from behind the bolt. Reinstall back plate.

NOTE: *Keep hardwood block with the salvaged packing material.*

c. Packing Procedure. To repack the gun in the original (dehydrated) packing box, proceed as explained below. Do not replace the drier container, envelopes, or sock. For treatment of guns to be stored, refer to section XI.

(1) Release the firing pin to avoid firing pin spring fatigue due to the spring being compressed in the cocked position.

(2) Insert the oil-impregnated hardwood block in the receiver, between the bolt and the back plate. Do not use any block other than the one especially processed for this purpose.

(3) Lay the gun upside down on a table or bench. Wear gloves while handling the gun.

(4) Insert a mounting pin in the rear mounting holes and a sleeve bushing and pin in the front mounting hole through the trunnion block.

(5) Fit the two notched composition spacers on the rear mounting pins with the notches turned downward to clear the edge of the bottom plate so that the spacers can be fitted snugly against the ears on the plate. Center the pin as closely as possible. Have the edge of the spacer that is covered with adhesive faced away from the gun.

(6) Fit the two larger composition spacers on the front mounting pin. Center pin and press the spacers snugly against the side plates. Have the edge of the spacer that is covered with adhesive faced away from the gun.

(7) Place the four cupped spacers on the mounting pins with the

rounded side toward the gun, and then add the four flat metal washers.

(8) Place the four speed nuts on the pins and press them up close to the flat washers sufficiently to compress the composition spacers slightly. The speed nuts must grip the pin tightly enough to hold the resilient spacers in compression. Be sure pins are centered.

(9) Place the four composition bushings on the mounting pins.

(10) Spread the cradle, place it around the gun, and bring the two sides of the cradle together, making sure the bushings on the mounting pins enter the holes. Insert the two screws which fasten the side of the cradle to the crosspiece.

(11) Lift and turn the packaged gun and cradle over (do not roll), and slip them into the shipping container.

(12) Replace the inside end of the container with its eight screws and then replace the cover end piece (plywood) with its four screws.

BASIC AIRCRAFT MACHINE GUNS, CAL. .50, T36 AND T25E3

Section XXVIII

REFERENCES

130. PUBLICATIONS INDEXES.

The following publications indexes should be consulted frequently for latest changes or revisions of references given in this section and for new publications relating to materiel covered in this manual:

a.	Ordnance supply catalog index (index to SNL's)	ASF Cat. ORD 2
b.	Ordnance major items and combinations, and pertinent publications	SB 9-1
c.	List of publications for training (listing CCBP's, FM's, FT's, MTP's, TB's, TM's, TR's, TC's, and LO's)	FM 21-6
d.	List of training films, film strips, and film bulletins	FM 21-7
e.	Military training aids (listing graphic training aids, models, devices, and displays)	FM 21-8
f.	List and index of administrative and supply publications (listing new AR's, Cirs, GO's, WDB's, T/O & E's, T/O's, T/E's, T/A's, T/BA's, MR's, RR's, WDP's, SB's, MWO's, and forms)	WD Pam. 12-6

131. STANDARD NOMENCLATURE LISTS.

a.	Ammunition, rifle, carbine, and automatic gun	ASF Cat. ORD 11 SNL T-1
b.	Cleaning, preserving and lubricating materials; recoil fluids, special oils, and miscellaneous related items	ASF Cat. ORD 5 SNL K-1
c.	Gun, machine, cal. .50, Browning, AN-M2, and T36, aircraft, basic	ASF Cat. ORD SNL A-38
d.	Gun, machine, cal. .50, T25E3, aircraft, basic	ASF Cat. ORD SNL A-67

REFERENCES

e. Packing materials used by field service for small-arms service ammunition ..... ASF Cat. ORD 11
SNL T-5

f. Tool-sets for maintenance of small and intermediate caliber ground, aircraft, and antiaircraft materiel, cannon and mortars, and of the 37-mm and 40-mm antiaircraft materiel ..... ASF Cat. ORD 6
SNL A-35

g. Truck, 2½-ton, 6 x 6, small-arms repair, M7, M7A1, and M7A2 ..... ASF Cat. ORD
SNL G-138

132. EXPLANATORY PUBLICATIONS.

a. **Ammunition.**

Ammunition, general ..... TM 9-1900
Instruction guides: Small arms accidents, malfunctions, and their causes ..... TM 9-2210
Small arms ammunition ..... TM 9-1990
Small arms, light field mortars and 20-mm aircraft guns ..... TM 9-2200
Targets, target material, and training course lay-outs ..... TM 9-855

b. Browning machine gun, cal. .50, M2, aircraft, basic ..... TM 9-225

c. **Care and Preservation.**

Basic maintenance manual ..... TM 37-250
Cleaning, preserving, sealing, lubricating and related materials issued for ordnance materiel ..... TM 9-850
Decontamination ..... TM 3-220
Defense against chemical attack ..... FM 21-40
Military chemistry and chemical agents ..... TM 3-215

d. Dictionary of United States Army terms ..... TM 20-205

e. Inspection of ordnance materiel ..... TM 9-1100

f. Qualifications in arms and ammunition training allowances ..... AR 775-10

g. Range regulations for firing ammunition for training and target practice ..... AR 750-10

h. Storage and Shipment.

Catalog of approved packaging instructions for major items and spare parts for ordnance general supplies	PS No. 1000
Instruction guide: Ordnance packaging and shipping (posts, camps, and stations)	TM 9-2854
Ordnance storage and shipment charts	SB 9-OSSC-A
Small-arms ammunition	WDSB 9-AMM 4

i. Synchronizing ..... TM 1-510

INDEX

A

Page

Accelerator, differences in models.. 9
Accessories 21
Aircraft machine guns
  bullet remains in chamber..... 64
  changing feed
    gun T25E3 36
    gun T36 33
  data 15
  defects found after firing small-arms ammunition 138
  description and data..... 2
  differences in models 2
  emplacing 27
  gun stops firing
    in battery position 54, 57, 63
    recoil parts out of battery position 53
  high-altitude flights 40
  loading and firing 37
  malfunctions and corrections 54
  operation under
    unusual conditions 39
    usual conditions 27
  points to be lubricated 51
  preservation and boxing 142
  unloading 38
Ammunition
  care, preservation, and handling.. 133
  classification and identification.... 126
  defective 54
  grades 131
  marking and packing 132
  storage and authorized rounds 136
  types, model, and lot number 127
Ammunition belt 58
Authorized rounds 136
Automatic fire, data 38
Auxiliary equipment 126

B

Back plate adjusting screw 59
Back plate group
  adjustment (gun T36) 67
  assembly
    gun T25E3 70
    gun T36 65

Page

  disassembly
    gun T25E3 68
    gun T36 65
  functioning (gun T25E3) 67
  maintenance
    gun T25E3 71
    gun T36 67
  redesigned 12
  removal and installation
    gun T25E3 68
    gun T36 64
Ballistic data 137
Barrel and barrel extension group
  adjustment and maintenance 103
  disassembly and assembly 103
  functioning 101
  removal and installation 102
Barrel buffer group (gun T25E3)
  assembly 100
  functioning and removal 97
  general 96
  installation and disassembly..... 98
  maintenance 101
  new air and washer spring type.... 15
Barrel extension
  modified 13
  (*See also* Barrel and barrel extension group)
Barrel jacket (*See* Receiver and barrel jacket group)
Belt feed lever 57
Bolt group
  assembly
    gun T25E3 85
    gun T36 79
  changing feed 35
  disassembly
    gun T25E3 83
    gun T36 77
  functioning 71
  installation 74
  maintenance 88
Bolt switch, redesigned 13
Breech lock cam 25
Bullet remains in chamber of gun.... 64

BASIC AIRCRAFT MACHINE GUNS, CAL. .50, T36 AND T25E3

C

Page

Cleaning, all parts 25, 50

Cocking lever
- assembly in bolt group 80, 86
- broken or worn 56
- functioning 71
- redesigned 12

Cold climates, operation in 39

Controls, general discussion..... 26

Cover extractor cam..... 13

Cover group
- assembly 109
- changing feed 35
- functioning 104
- installation and disassembly..... 107
- maintenance 110
- removal 106

D

Demolition to prevent enemy use.. 41

Driving spring (outer), redesigned.. 12

Dry-cleaning solvent 25

E

Ejector, assembly to extractor.... 82, 87

Equipment
- auxiliary 126
- service upon receipt..... 22

Extractor, bent or broken..... 58

Extractor assembly
- differences in models..... 2
- functioning 72
- redesigned 15

F

Field report of accidents..... 1

Firing machine gun..... 37

Firing pin extension
- binding 54
- worn shoulder 55

Firing pin release, data..... 16

Firing pin spring
- assembly in bolt group..... 79, 85
- weak or broken..... 54

Firing pin striker..... 54

Page

Firing precautions
- blank ammunition 136
- cal. .50 ammunition..... 134

H

Headspace
- adjusting 29
- checking 30
- definition 27

Hot climates, operation in..... 40

I

Identification information 2

L

Lot numbers (ammunition).... 127, 131

Lubrication 50

M

Maintenance, preventive 51

Maintenance instructions 43

O

Oil buffer group (gun T36)
- adjustment 95
- assembly 93
- disassembly 92
- general discussion 83
- functioning 90
- installation 91
- maintenance 95
- removal 90

Operating instructions 22

Operating slide group (gun T36)
- adjustment and maintenance..... 118
- functioning, assembly, and disassembly 117

Operation under usual conditions.... 27

Organizational tools and equipment
- list of 43
- (*See also* Tools, parts, and accessories)

P

Packing procedure 142

Painting 53

Phosphate finish 26

INDEX

R	Page
Receiver and barrel jacket group	
adjustment	115
assembly	114
changing feed	35
disassembly	112
functioning	111
general	110
maintenance	116
Recoil booster	2
Reports and records	1
Retracting slide group	
functioning, assembly, and disassembly	119
general	118
maintenance	125
Rifling data	16

S	Page
Safety	27
Sear mechanism	71
Sear notch, worn	55
Sear spring, weak	55
Sear spring assembly	85
Storage and shipment	140
Storage of ammunition	136
Stud, bolt switch	82

T	
Timing	31
Tools, parts, and accessories	17
Trigger operation	26

U	
Unsatisfactory report	1